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Important Bird Areas: Anguilla

Home range, habitat and diet of Honey-buzzards

Bird Photograph of the Year 2015



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Front-cover photograph: Bird Photograph of the Year 2015: Grey Heron *Ardea cinerea*, Hungary, January 2015. *Tom Dyring*



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The main papers in this issue of *BB* continue two regular themes from recent years. Our series on UK Overseas Territories has provided fascinating insight into parts of the globe that are unfamiliar to most British birders. This month, Steve Holliday and his colleagues bring a touch of the Caribbean to *BB*, with their portrait of the important birds and bird areas of Anguilla. Closer to home, but perhaps equally unfamiliar to many of us, Neil Bucknell ponders the prospects of Belarus in his *BB eye*. The second theme is that of learning more from new tracking technologies. This time the subject is the Honey-buzzard, and the paper by Fridtjof Ziesemer and Bernd-Ulrich Meyburg (whose name will be very familiar to most readers when it comes to tracking raptors) complements the work we published last year on British Honey-buzzards, which proved to be one of the most popular articles of 2014. Completing the issue are the results of the latest Bird Photograph of the Year competition, our familiar showcase of camera-wielding talent. As ever, you can see the images in all their glory – and distinctly bigger than the dimensions of *BB* will allow – at our stand at the Birdfair (M3, 24–25), and you can also enjoy a larger selection of the top images by visiting our website www.britishbirds.co.uk

Roger Riddington



British Birds aims to: ❖ provide an up-to-date magazine for everyone interested in the birds of the Western Palearctic; ❖ publish a range of material on behaviour, conservation, distribution, ecology, identification, movements, status and taxonomy as well as the latest ornithological news and book reviews; ❖ maintain its position as the journal of record; and ❖ interpret scientific research on birds in an easily accessible way.

Belarus – challenges and opportunities in a post-Soviet state

Belarus is probably not top of most British birders' list of places to visit in Europe. Some may know it as an anomalous, post-Soviet state run by an eccentric ruler, or as a country still suffering the after-effects of the Chernobyl accident in neighbouring Ukraine, in 1986. Its best-known birding highlights are the presence of the nearest population of Azure Tits *Cyanistes cyanus* to the UK, its world-class wetlands, and for being the site of the greater part of Europe's largest-surviving primeval forest, the Belavezhskaya Pushcha, shared with Poland (where it is known as the Białowieża Forest). Last spring I had the privilege of spending a week birdwatching in the company of Alexandre Vintchevski, which gave me a fascinating insight into the challenges for birdlife, and BirdLife, in this little-known country.

Belarus is a landlocked country, bounded in the north by Lithuania and Latvia, to the west by Poland, to the south by Ukraine and to the east by Russia. Despite being by far the smallest of the three core Soviet countries that finally dissolved the Soviet Union in 1991, it is still some 200,000 km² in extent – about 80% of the size of the UK. It is generally relatively flat, with a maximum elevation of just 345 m above sea level, about 40% forested and has substantial areas of marsh, mire and wetland. It lies in similar latitudes to England, but inevitably has a more continental climate, colder in winter, warmer in summer and has an average annual rainfall of 600–700 mm per year. The northern part lies in the taiga zone, but it is the wetlands of the south that hold most of interest to ecologists and birdwatchers.

There are about nine million human inhabitants, some two million of those in the capital, Minsk. The population has been declining, and rural depopulation is evident, with abandoned houses in many villages. It is an old-fashioned, Soviet-style command economy, the last in Europe, with most economic enterprises under state control. The largest single source of GDP is derived from

the refining of petroleum products, but food-stuffs and machinery (in both cases mostly exported to former Soviet states) and forestry products are important.

APB BirdLife Belarus was established in 1985, and is now the largest environmental NGO in the country, with 3,000 members and an encouragingly large proportion of young members. It has a team of 15 staff, and has an impressive list of achievements to its credit. It has helped to secure local reserve status for the Turau Meadows, an important wetland in the Prypyats floodplain in the south of the country, which holds significant breeding populations of waders, including Great Snipe *Gallinago media* and a few Terek Sandpipers *Xenus cinereus*, and marsh terns *Chlidonias*. It has worked with overseas and international partners, including BirdLife International, the RSPB, BTO and Frankfurt Zoological Society. One of the challenges it faces is the lack of a decent, up-to-date field guide in Russian, the most recent still being *A Field Guide to the Birds of the USSR* (Flint *et al.*) – the 1968 version, which lacks the superior plates used in the English-language edition published by Princeton in the 1980s.

There are about 150 members active in carrying out surveys, although an attempt to establish a breeding bird survey failed. A national breeding bird atlas is being undertaken at the same time as the current European Atlas, using 50-km grid squares, jointly supported by APB and the National Academy of Science. It has a budget of only £10,000, and the academy is seeking scientific credibility by including intensive counts in typical habitats, and extrapolating the results by reference to national habitat data to generate national population estimates. When you compare this with (for example) the recent Berkshire local atlas project, with 500 observers covering 400 tetrads, the magnitude of this task is clear.

So what are the prospects for the birdlife of Belarus? At first sight, the state-run collective farms provide a more attractive habitat than our own arable areas. This is not due to

any active agri-environmental policy, but simply because salaried managers of collective farms have little incentive to intensify production, as they personally have little to gain. Northern Lapwings *Vanellus vanellus* and Skylarks *Alauda arvensis* are still widespread. Many species lost (or almost lost) to Britain in the last 100 years are still commonly encountered, including the Corn Crake *Crex crex*, Wryneck *Jynx torquilla* and Red-backed Shrike *Lanius collurio*. However, substantial land drainage took place in the Soviet era. Rural depopulation is indirectly having an impact on the remaining wet areas and mires, as maintenance of these areas in a favourable condition is dependent upon continued grazing. Extensive grazing is labour-intensive, so as people have left the land it has been abandoned, leading to the encroachment of scrub. APB has acquired a German-built wide-tracked cutting and mulching machine to help keep the scrub at bay, which is currently on loan to the National Reserve service to help maintain the important mires at Sporava.

One species for which this is a particular threat is the Aquatic Warbler *Acrocephalus paludicola*. Until the 1990s, little was known of its range outside Poland, Hungary and Germany. The main reason was that no-one thought to survey for this relatively discrete warbler in the evening, when it sings its short song from among grass tussocks, quite unlike the prolonged and showy displays of the Sedge Warbler *A. schoenobaenus*. It soon became clear that Belarus held a substantial population of Aquatic Warblers, with up to 60% of the world population of Europe's most threatened migrant songbird in the marshes and mires of the south. One site, Sporava Mire, holds 9% of the world population alone.

The species now features on APB's logo.

The economic situation in Belarus could pose a threat. The country is living beyond its means, as the government tries to prop up living standards, and has run up substantial external debts. The pressure is on to boost external earnings by increasing food and forestry exports. Peat extraction is being promoted as a domestic source of power and for sale abroad for garden and horticultural use. When I was there, the position of Minister of Environment had remained unfilled for some months. However, there are also helpful factors. Wildlife stories are welcomed by the country's state-controlled media, as providing popular but apolitical subjects for television. Live pictures from a Common Kestrel *Falco tinnunculus* nest in the south-western city of Brest were streamed on the internet in 2015. ABP is attempting to raise funds for rewetting drained peatlands (which are mineralising, releasing CO₂ into the atmosphere) by selling carbon credits abroad. With a recession forecast for the next two years, Belarus's wildlife needs all the help it can get.

Belarus is not the most straightforward country to visit. A visa is required, and if you are not part of an organised group, you will need a written invitation from someone in Belarus. Once there, accommodation is generally good and reasonably priced, although finding food when travelling around can be hit and miss, and Soviet-era standards of service can still be encountered, but you will also be welcomed and smiled at too! It makes a rewarding birding destination, and you will see some interesting birds and habitats, as well as conservation achievements derived from slender resources.

Neil Bucknell



News and comment

Compiled by Adrian Pitches

Opinions expressed in this feature are not necessarily those of *British Birds*

British Birds at the Birdfair

There is only one date for any birder's diary in August: Birdfair. This year it's over the weekend of 21st–23rd August, and it returns to the cause highlighted at the very first fair, in 1989 – the illegal slaughter of migrant birds in the eastern Mediterranean.

Birdfair 2015 is a special event for *BB* too as we're launching the digital edition of the journal. Please come and see us in Marquee 3 (stands 24–25) to learn more about our 'e-*BB*', which you can read on your desktop, tablet or smartphone.

And don't miss the presentation of the *BB* Bird Photograph of the Year prizes by Simon King in the Events Marquee on the Friday afternoon at 4.00 pm. It's the oldest bird photography competi-

tion of its kind, now in its 39th year.

In fact, Friday finishes with a flourish: a little later on, and in collaboration with RSPB Birders, we're hosting a 'Best Days with British Birds' event – in Lecture Marquee 1 at 6.00 pm. The audience will decide the winner of the 'Best Ever Day' title, as Bill Oddie, Ian Wallace, Adam Rowlands and Lucy McRobert tell us stories of migrants, falls, artistic splendour and the sheer elation felt in the company of birds. This event is followed by a drinks reception.

(Readers with long memories will recall that *Best Days with British Birds* was the title of a compilation of birders' best days in the field that we published in 1989, the year of the first Birdfair.)

Landmark environmental project in Essex



BAM Nuttall

247. The first phase of the Wallasea Island Wild Coast Project, the RSPB's flagship coastal wetland re-creation project in Essex, has just been completed. In July, sea walls surrounding part of the island were breached to allow the sea to flood 166 ha of newly created habitat. This photograph was taken before the sea walls were breached. The main brown areas in the lower half and right-hand side of the photograph are now intertidal habitat. Wallasea is by far the largest coastal wetland recreation project ever attempted in the UK and, arguably, the most innovative. The project has used clean soils, excavated during construction of Crossrail's railway tunnels beneath London, to raise land levels at Wallasea and create a large number of lagoons and islands. Other partners in the project are Defra, the Environment Agency and Natural England.

This scheme will eventually create 670 ha of wetland, which is expected to support large numbers of both wintering and breeding waterbirds, the latter hopefully including Spoonbills *Platalea leucorodia*. The design includes a range of features intended to ensure that it continues to provide valuable wildlife habitat under a wide range of future sea levels. Details of how to visit can be found at www.rspb.org.uk/discoverandenjoynature/seenature/reserves/guide/w/wallaseaisland

Roseate Terns score a century

Barely had the latest Rare Breeding Birds Report (*Brit. Birds* 108: 373–422) been printed when significant news came through about the UK's rarest breeding seabird, whose only colony is a series of 'terraced houses' on Coquet Island in Northumberland. The Roseate Tern *Sterna dougallii* is enjoying a bumper breeding season with 100 pairs currently nesting on Coquet. This is up from 24 pairs on the island in 1999.

It is a success story that can be attributed to a programme of conservation work over the past 15 years, aimed at reversing the fortunes of this Red-listed species. The RSPB began managing the island for Roseate Terns in 2000 by introducing nestboxes on specially created shingle terraces.

Paul Morrison, warden at RSPB Coquet Island, said: 'The whole project kicked off when I visited Rockabill, Co. Dublin, which is home to Europe's largest Roseate Tern colony. I noticed they used boxes there so I brought the idea back to Coquet Island. Roseate Terns like to nest in tight communities in

sheltered locations so the boxes on terraces are perfect for them.' The nestboxes had an immediate effect, with the number of pairs breeding on the island rising from 24 in 1999 to 34 the following year.

Paul continued: 'In addition to the nestboxes, we protect the birds from illegal disturbance and egg theft with a 24/7 surveillance scheme staffed by a team of dedicated RSPB staff and volunteers.'

Coquet is designated as a Special Protection Area under the EU Birds Directive, for its internationally important populations of seabirds, including the Roseate Tern, which receives the highest level of protection under the directive, along with other threatened species. SPAs and the Birds Directive in general have been vital to the conservation of Roseate Terns and other key species in the UK. However, the EU is consulting on the future of the Birds Directive (and its sibling, the Habitats Directive), which may lead to a weakening of the directives, with potentially disastrous consequences for many threatened species.

Bitterns are booming too

And a major milestone has been passed by Britain's Eurasian Bittern *Botaurus stellaris* population too. More than 150 'booming' males were recorded in 2015.

Bittern numbers peaked at around 80 booming males in the 1950s, but had declined to only 11 boomers in England in 1997. Simon Wotton, an RSPB conservation scientist, said: 'In the late 1990s, the Bittern was heading towards a second extinction in the UK [it was absent as a breeding bird between the 1870s and 1911], largely because its preferred habitat – wet reedbed – was drying out and required intensive management, restoration and habitat recreation. But thanks to efforts to improve the habitat, combined with significant funding from two projects under the EU Life Programme, the Bittern was saved, and we're delighted that its success keeps going from strength to strength.'

Over the last 25 years there have been several significant habitat-restoration projects, some of which are now RSPB reserves, including:

- **Ham Wall, Somerset** Work began on creating this site from old peat-workings in 1995.

Bitterns have been booming regularly since 2008 and the first nesting took place that year. In 2015, 17 boomers have been recorded.

- **Lakenheath, Suffolk** Beginning in 1995, this wetland site was converted from carrot fields. Bitterns were first recorded booming in 2006 and first confirmed nesting in 2009. This year six booming males were recorded on site.
- **Ouse Fen, Cambridgeshire** This partnership project with Hanson has seen wetland creation from former mineral workings, which started around ten years ago. In time, it will be the largest reedbed in the UK. The first confirmed booming was in 2012, and ten males were recorded in 2015.

According to this year's figures, although East Anglia remains the Bittern's regional stronghold, with over 80 booming males, the top UK county for Bitterns is Somerset, with over 40 booming males. Following the restoration and extensive creation of large wetlands in the Avalon Marshes, at Ham Wall (RSPB), Shapwick Heath (Natural England) and Westhay Moor (Somerset Wildlife Trust), Bitterns became re-established in Somerset in 2008.

Tracking Turtle Doves to Africa – and back

A species rapidly descending into the rare breeding bird category is the Turtle Dove *Streptopelia turtur*. The British breeding population of this summer migrant has declined by a staggering 96% since

1970. Now a satellite-tagged bird has helped RSPB researchers to map the Turtle Dove's migration route; the next step is to identify all the threats to this species along the way.

In July 2014, the RSPB fitted a satellite tag to a Turtle Dove from Suffolk before it embarked on its mammoth migration. Titan, the tagged dove, was tracked throughout his 5,600-km journey from Suffolk to Mali, and back again, all in real time. The tag recorded Titan's journey across epic landscapes such as the Atlas Mountains and Sahara Desert, and also uncovered the fact that he travelled around 500–700 km per night, flying at a maximum speed of 60 km/h.

The RSPB's John Mallord said: 'This is the first time that we have ever been able to track a UK-breeding Turtle Dove to its African wintering grounds. On top of his wintering grounds, we also have his migration route, where he stopped to rest

and refuel and how long he spent in different places. Our aim now is to build on this new information, which will be used to help us to target our conservation efforts far more effectively on precisely those areas the birds are using when they leave the UK.'

RSPB scientists and partners at BirdLife hope to explore the key habitats, land use and food resources throughout the migration route in order to understand the reasons behind the alarming decline. The research will help in the planning and implementation of conservation actions on a local and international scale to help save Turtle Doves from extinction in the UK.

And more Cuckoos join the track pack

Before the Turtle Dove, it was satellite-tagged Cuckoos that provided the first definitive maps for migration routes and wintering areas for a trans-Saharan migrant. The BTO's groundbreaking research continued this summer, and satellite tags have been fitted to eight more Common Cuckoos *Cuculus canorus* to help understand why this iconic bird is disappearing from large parts of the UK.

During the last four years researchers have identified two distinct southerly migration routes: one through the western Mediterranean, taking in Spain, Morocco and West Africa; the other crossing the central Mediterranean, through Italy and the central Sahara. So far, all of the tagged Scottish and Welsh Cuckoos have taken the central route, while only Cuckoos from England have taken the western route and BTO scientists want to know if this is contributing to their different fortunes in the UK (the most shocking losses have

occurred in England – almost three-quarters of Cuckoos breeding in England have been lost, whereas in Scotland they are doing much better, increasing by 3% in just over a decade). So we need to know which route birds from northern England take and whether this differs east and west of the Pennines.

To find out, Cuckoos have been tagged from either side of the Pennines: three in North Yorkshire, two in Lancashire and one in West Yorkshire, as well as one in Wales and one in Nottinghamshire. Chris Hewson, lead BTO scientist on the project, said: 'The Cuckoo project has entered a very exciting phase. We now know more about the general routes that our birds take to get to central Africa, and how they use different sites as staging posts. But we are now completing our knowledge of what Cuckoos from different parts of the UK do and how this might be affecting populations in different areas.'

The iPhone Photography Awards



David Craik

248. Common Starlings *Sturnus vulgaris* at café table.

Using the camera on your mobile phone is the very antithesis of carting around a camera, a large lens and the assorted paraphernalia that allow some dedicated photographers to come up with the sort of shots featured in Bird Photograph of the Year (pp. 482–494). However, the camera quality on many phones is now impressive and British photographer David Craik took second place overall in the recent iPhone Photography Awards: www.ippawards.com

Featuring Common Starlings *Sturnus vulgaris* that came down to explore the pickings at a British coastal café (plate 248), it was the only wildlife shot in the overall top three.

Fair Isle research highlights changes in migrant arrivals

A major project to analyse more than 60 years of migration data from Fair Isle is revealing unexpected changes in the phenology of some long-distance migrants from Africa.

The evening log call is an institution at most bird observatories, but the results of the daily census on Fair Isle are remarkable for various reasons, not least for the 'constant effort' aspect of the recording in spring and autumn. The basic routine of the warden and his assistants has remained unchanged for decades, while the limited accommodation on the island means that visitor numbers have varied little over the same time period. Combine that with the island's potential for attracting migrant birds from all points of the compass and the result is a dataset that scientists say is unique.

The Fair Isle Bird Observatory log data show that spring migration has become much earlier in recent years for many species, such as Barn Swallow *Hirundo rustica*, which, overall, is arriving up to three weeks earlier. More surprisingly, it is clear for many species, such as Willow *Phylloscopus trochilus* and Sedge Warblers *Acrocephalus schoenobaenus*, that while the earliest birds are arriving markedly earlier, the later-arriving birds

in spring have actually become *later* – in other words, the spring migration period for many species has become more protracted.

The patterns in the timing of autumn migration are also more complex than might have been expected, even in related species – for example, while autumn migration of House Martins *Delichon urbicum* has become progressively later, that of the Swallow has become earlier, again by up to three weeks, compared with 60 years ago.

Speaking on behalf of the Fair Isle Migration Project, a new initiative involving a collaboration between the Observatory (www.fairislebirdobs.co.uk) and Aberdeen University, Will Miles said: 'The natural world is changing, including the timing and numbers of birds on migration, and a crucial challenge facing scientists is to identify and understand these changes and their causes.'

'It's too early to say for sure exactly *why* some birds are arriving so much earlier on Fair Isle, while others seem to be delaying their arrival, but possible causes may include changing climate and weather patterns along migration flyways, also changes in the summer breeding range and population size of many species across Europe.'

As well as differences in phenology, the Fair Isle data show some dramatic changes in abundance – perhaps none more striking than the increase in Yellow-browed Warblers *P. inornatus* (fig. 1).

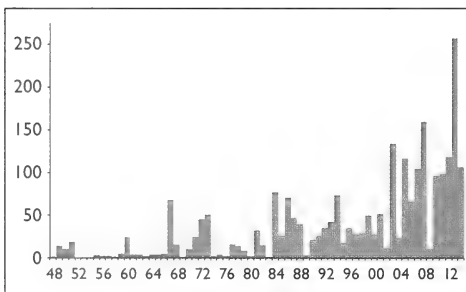


Fig. 1. Numbers of Yellow-browed Warblers (figures show total number of bird-days) on Fair Isle, 1948–2014.

Esther Williamson

Esther Williamson, the widow of Ken Williamson (the first warden of Fair Isle Bird Observatory, from 1948 to 1957), has died, at the age of 91. The Williamsons played a major role in the formative years of the Observatory, when (as now) the warden's spouse was every bit as integral to the whole operation.

Where was that colour-marked wader ringed?

The International Wader Study Group (IWSG) has coordinated the colour-marking of waders throughout Europe and the East Atlantic Flyway for over 50 years, and the database covering active schemes is now available online, at www.waderstudygroup.org

Click on the dropdown menu 'Colour Marking' and then on 'The Register'. The register is a Google spreadsheet, updated with changes and new schemes on a regular basis. There is an explanation about how to use the filter functions to search the database and, as long as you have recorded all the marks, and rings and flags are not missing or faded, you should be able to trace almost all schemes on

this database. In a very few cases it may be necessary to contact sightings@waderstudygroup.org – if the mail address of the project leader is not on the database, or you cannot trace the scheme.

The IWSG coordinates the colour-marking of waders in Europe on behalf of EURING and all the European ringing offices. Since most waders are migratory, the group also coordinates the whole of the East Atlantic Flyway, extending from northern Canada, Greenland and parts of northern Russia lying outside Europe down to West and southwest Africa.

(Contributed by Jim Wilson, IWSG Colour Marking Coordinator)

Hen Harrier Day 2015

The second Hen Harrier Day, organised by *Inglorious* author and activist Mark Avery, is scheduled for Sunday 9th August with events on various northern uplands. There's also a special evening celebration of the Hen Harrier *Circus cyaneus* on 'Hen Harrier Eve' at the Palace Hotel in Buxton, Derbyshire. The star-studded line-up includes TV presenter Chris Packham, author Mark Cocker and Turner Prize winner Jeremy Deller. For all the latest Hen Harrier Day news, including venues for 9th August, see www.henharrierday.org

The Simon Aspinall Wildlife Education Centre

The Centre, named for naturalist and conservationist Simon Aspinall (see *Brit. Birds* 105: 98–99), was opened on 12th June by Sir David Attenborough. It is a remarkable, purpose-designed building, set sympathetically within the north Norfolk coastal landscape at the Norfolk Wildlife Trust Cley Marshes Reserve. The Centre hosts diverse programmes of instruction and education, helping school and community groups, and other visitors, to explore, discover and be inspired by wildlife, particularly the rich wildlife of the north Norfolk coast where Simon lived. For more information see: www.norfolkwildlifetrust.org.uk/discover-and-learn/simon-aspinall-wildlife-education-centre

In the rubble of Palmyra...



Ahmed Abdullah

249. In Palmyra, under ISIS occupation, and being bombed by the Syrian regime, a local birdwatcher went back to his home and took this photo of the debris. 'What is very precious to us is totally worthless to others,' he wrote alongside the photo, posted on Facebook.

New owner for *The Birdwatcher's Yearbook*

The Birdwatcher's Yearbook was first published in 1981 by John and Joyce Pemberton. When they retired, in 2000, the Pembertons sold the Buckingham Press company to Hilary and David Cromack, who have continued to publish this popular guide every year. The new owner is Neil Gartshore, whose company, Calluna Books, is based in Dorset – Neil is a former Dorset county recorder and chaired the Dorset Bird Club for a number of years. If you haven't seen a copy of the *Yearbook*, contact Neil (enquiries@callunabooks.co.uk) for a back issue. The cost is £5.00, which includes a discount voucher of £3.00 for the 2016 edition.

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Important Bird Areas

Anguilla

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Pedro Geraldez

250. Sooty Terns *Onychoprion fuscatus*, Dog Island, Anguilla, May 2007.

Abstract Anguilla is a UK Overseas Territory, the northernmost of the island groups in the Lesser Antilles, in the eastern Caribbean. It has been long known for its seabirds; 16 species currently breed, with Red-billed Tropicbird *Phaethon aethereus*, Brown Booby *Sula leucogaster* and Sooty Tern *Onychoprion fuscatus* occurring in globally important numbers. There are 16 Important Bird and Biodiversity Areas (IBAs), including five of the islands holding the main seabird colonies. The mainland IBAs are identified for populations of breeding seabirds, including Least Terns *Sternula antillarum*, and/or five restricted-range terrestrial species confined to the Lesser Antilles Endemic Bird Area (EBA). The Dog Island IBA is one of the most important seabird colonies in the Caribbean. Considerable economic growth in recent decades, especially from increased tourism, presents challenges to ensure that new development is sustainable, helping to maintain the rich biodiversity and natural resources upon which the growth is founded.

Introduction

Anguilla is an island at the edge. Located in the tropics at 18°30'N 63°50'W, it lies just beyond the eastern end of the islands in the Greater Antilles, which stretch across the northern Caribbean, and at the northern-

most point of the Lesser Antilles, the islands that mark the eastern border of the Caribbean Sea.

The main island of Anguilla is some 26 km long and 5 km across at its widest points, with an area of 91 square kilometres. It is the

largest and only inhabited island and provides the collective name for an archipelago of 22 islands that for the most part are little visited. The smaller islands, around 660 ha in total, are scattered fragments of a tropical paradise which provide safe nesting grounds for some of the most important seabird populations in the Caribbean (Lowrie *et al.* 2012). To avoid confusion, this introduction refers to the main island and its administration and governance. The smaller islands are referred to specifically, particularly in the IBA and seabird sections.

On the approach to Anguilla by boat, the low-lying islands emerge slowly out of clear blue seas and white-topped surf. A stretch of sandstone cliffs on Anguilla reaches 65 m, the highest point in the islands; elsewhere, the islands are mostly low, rocky outcrops of limestone and coral. The hard coastline is interspersed with white sandy beaches, behind several of which brackish lagoons have formed. Except for the isolated outcrop of Sombrero, which lies on a separate rock bank 65 km to the northwest, the outer islands are all visible from the mainland.

Anguilla is part of the island arc that curves down the eastern Caribbean, following the line where the Caribbean and Atlantic tectonic plates meet. The outer islands in the north, such as Anguilla and

nearby St Barthélemy, are sedimentary islands, their limestone rocks laid down in shallow seas 20–30 million years ago on a base of older rocks and subsequently gently folded and uplifted. On Anguilla there are remains of earlier volcanic activity underlying the limestone, with igneous rocks and breccias, visible at the northern end of Sandy Ground village and in Crocus Bay. The islands in the archipelago, along with St Martin/St Maarten and St Barthélemy, are high points on the Anguilla bank, an area perhaps connected in times when sea levels were lower. There are still active volcanoes on islands to the south, such as Montserrat, and earthquakes are occasionally experienced on Anguilla.

The limestone on Anguilla dips gently from the north, where the coastline comprises low cliffs, mostly below 50 m in height, down to the south coast. There are extensive areas of limestone pavement across the island and in places the rock has become heavily fissured and difficult to walk across. Away from coastal areas, a dry evergreen scrub now covers the limestone and there is little surface drainage other than four ponds in the east of the island. In a few areas, such as Katouche Canyon and along the northeast coast, cave systems have formed. In some areas, thin soils have developed but these remain



251. Limestone cliffs at Little Bay on the main island of Anguilla, September 2011. These cliffs provide nesting sites for both Red-billed *Phaethon aethereus* and White-tailed Tropicbirds *P. lepturus*.

isolated pockets and are utilised for grazing livestock and arable farming.

Anguilla has a tropical climate; the temperature varies rather little, with daily mean temperatures in the range 26.4°C–29.8°C. The Atlantic trade winds, which brought European explorers in their sailing ships to the Caribbean, blow from the east at about 15–28 km/h. The annual average rainfall is low for the region at 970 mm, with an annual range of 460–2,050 mm, depending on the number and intensity of storms that pass over the islands, mainly from June to November. Storms can be dramatic and brief; they can also intensify in power to bring hurricane-force winds, extensive rainfall, wave surges and flooding. The most damaging hurricanes in recent years were Luis in 1995, Lenny in 1999 and Omar in 2008.

History

The first people to set foot on the islands were Amerindians: tribes from South America, who moved up through the islands of the eastern Caribbean, travelling by wooden canoes and speaking Arawak. The first settlements on the islands have been dated to 1500 BC and occupation was intermittent until further Amerindians arrived around AD 600, using their skills to take advantage of inshore fish and shellfish and by starting to grow crops. On Anguilla, the population was limited by lack of fresh water and soil but even on this small island, evidence of 42 sites and villages has been found covering the period to AD 1500.

Amerindians were still on the island by the time Columbus sailed into the Caribbean in 1492, although it is not clear when they left the island they named Malliouhana, or what this name means. It was a European who named it Anguilla, as the island's long thin shape recalled an eel or *anguille*. The date of European discovery is uncertain but we know that a party of British settlers arrived on Anguilla in around 1650. The new inhabitants began growing crops but found the island's dry climate and thin soils too poor for intensive agriculture. This was a period of exploration and competition for land and trade among Europeans, who fought over Caribbean islands during the seventeenth and eighteenth centuries. At

various times the Anguilla islands were in Dutch, French and British hands. For the most part, however, Anguilla remained British and new investors arrived and developed several estates growing cotton, sugar and other crops. They also brought with them livestock, including goats and sheep.

This was also the time of the slave trade and its effects reached Anguilla as estate owners brought in enslaved Africans. As a result of the difficult agricultural conditions, the estates were slowly abandoned during the nineteenth century, leaving an Anguillian population that was almost all of African or mixed descent. They survived by fishing, building boats, harvesting salt, raising livestock and trading between islands in their boats (Petty 2008). Life was never easy, especially during periods of drought, and as recently as the 1950s there was up to 80% unemployment. At times, further displacement took place with local people moving between islands or travelling further afield to find employment, which is a practice that continues today.

Anguilla has been administered by Britain through its arrangements in the eastern Caribbean and, as early as 1824, it was placed under the administrative control of nearby Saint Kitts. In 1967, Britain granted Saint Kitts and Nevis full internal autonomy, and Anguilla was also incorporated into the new unified dependency, against the wishes of many Anguillians. This led to a crucial episode in the island's history with two rebellions, in 1967 and 1969: the Anguillian Revolution. The goal of the revolution was independence from Saint Kitts and Nevis, and a return to being a British colony. British authority was fully restored in July 1971, and in 1980 Anguilla was finally allowed to secede from Saint Kitts and Nevis and become a separate British Crown Colony, now a UK Overseas Territory (UKOT).

The population in 2013 numbered over 12,000 and is widely dispersed across the island. The administrative capital is The Valley, an area that retains an open and relaxed feel, providing a nucleus for business, community services, culture, sport and even agriculture close to its centre. In the last few decades, Anguilla's financial fortunes have also changed, with an increase in tourism,

particularly by visitors from North America and Europe. In recent years, tourism has accounted for over 50% of employment, bringing an increase in infrastructure and social investment and at the same time pressures on the natural environment. The ease of air travel and investment in transport facilities is boosting tourism and in 2013 Anguilla attracted over 69,000 stopover tourists and 82,000 day visitors (data from Caribbean Tourism Organisation). Peak months for visitors are from December to April but a range of activities is extending the tourism season. The majority of visitors still arrive by boat, especially for day trips from nearby St Martin/St Maarten.

Environmental protection

The Government of Anguilla develops and enacts legislation and policy. Its environ-

mental lead is through the Department of Environment (DoE), which also has an operational role. The Department's work is complemented by that of the Anguilla National Trust (ANT), a statutory body and membership organisation committed to the conservation of the island's natural and cultural heritage within the context of sustainable development.

There is a range of environmental and biodiversity legislation in place or being developed on Anguilla. The Trade in Endangered Species Act (TESA) is the local legislation that gives effect in Anguilla to the Convention on Trade in Endangered Species of Wild Fauna and Flora (CITES). In 2014 the UK Government extended the CITES regulations to Anguilla.

The Biodiversity and Heritage Conservation Act (BHCA) is aimed at the conservation of the wildlife native to Anguilla and of Anguilla's rich historic and cultural heritage. The BHCA is a response to the threat to Anguilla's wildlife and heritage resources posed by human activities, especially increasing land development. It provides a sound framework for species conservation, for example through species action plans, and for the designation of protected areas including the creation of management plans. The BHCA also complements the Bill for the Environmental Protection Act 2008 (EPA), which is primarily concerned with pollution.

The draft bill for the EPA 2008 provides for an effective environmental assessment process for all activities that might have a significant adverse impact on the environment and establishes a licensing system to ensure that activities will commence and continue to be conducted in a manner that does not damage the environment. A recent assessment of environmental protection frameworks in the UKOTs (FIELD & RSPB 2013) identified the EPA 2008 and the Physical Planning Bill 2001 as priority gaps for completion. Intro-



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252. A remnant area of mature dry forest at Crocus Bay on the northern coast of Anguilla mainland, September 2011.

ducing mandatory Environmental Impact Assessment (EIA) procedures, improving access to information and clarity of the status of legislation would increase accountability and enable public participation.

Some of the recent conservation initiatives on Anguilla include ecosystem-based assessments, habitat mapping (terrestrial and marine), environmental economic evaluations, and capacity building in remote sensing and GIS applications in relation to environmental analysis. A recent 'Greening the Economy' workshop focused on broad national environmental issues. There is a proposal for a full national ecosystem assessment for Anguilla, which will help to inform a national development plan for the islands.

Island habitats

The diversity of habitats and biodiversity on Anguilla is influenced by its isolation, small land area, low elevation and climate. The main habitat types are limestone scrub and thickets, brackish ponds, coastal cliffs, beaches and inshore marine habitats including coral reefs (Medcalf & Cameron 2013; Medcalf *et al.* 2014). To date 141 species of bird have been recorded, of which 50 have bred in recent years.

From a distance, large parts of the main islands of Anguilla and nearby Scrub Island appear green, as the limestone areas are dominated by a dry, evergreen, drought-tolerant scrub. Species here have adapted to low and intermittent rainfall, long periods of sunshine and continuous drying winds. In less exposed areas and away from the coast, some trees and bushes grow to 5 m tall and it is easy to lose your way in long stretches of dense vegetation. Many of the shrub species (including Torchwood *Amyris elemifera*, Mutton Polly *Antirhea acutata*, Chink or Cherry *Boussieria succulenta*, Wild Grape *Coccoloba krugii* and White Wattle *Eugenia foetida*) are found in similar habitats across the Caribbean. A short walk through this habitat, especially alongside a wetland, will provide encounters with most of the island's resident landbirds.

In the east of the mainland and on the outer islands, prevailing winds sculpture the bushes and keep the vegetation low. Frangipani *Plumeria alba* and the tall spikes of the tree cactus *Pilosocereus royerii* punctuate the scrub, which thins out on limestone pavements and more exposed parts of the coast. At Windward Point, at the eastern end of Anguilla, is a superb field of Pope's Head



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253. An area of limestone, with the distinctive Pope's Head Cactus *Melocactus intortus*, at Windward Point on the main island of Anguilla, September 2011.

Cactus *Melocactus intortus*.

In sheltered areas and in a few natural folds in the topography, areas of taller limestone thicket and dry forest are found. The most extensive area remaining is in the Katouche Canyon where the thick, dense canopy provides moist conditions and respite from the sun. Loblolly *Pisonia subcordata*, Gumbo-limbo or Turpentine Tree *Bursera simaruba*, Wild Fig *Ficus citrifolia*, Wild Pine *Tillandsia utriculata* and most of the native tree and shrub species can be found here. This habitat was probably once more widespread but over recent centuries, large trees have been cleared for agriculture, construction and charcoal. Further smaller areas of this habitat can be found at West End point and along Crocus Bay on the north coast of Anguilla.

Where goats browse, a low thorn scrub community dominates, which can be extensive and impenetrable. Common plants include Five-finger *Randia aculeata*, Sloe *Reynosia uncinata*, Thorn *Ziziphus rignonii* and Cockspur *Castela erecta*. The herb layer here and around some wetlands attracts a range of invertebrates, although these are little studied to date.

Around 1,335 ha of the mainland is used for agriculture, mainly to grow vegetables and fruit, with isolated grassland supporting goats and smaller numbers of cattle and sheep. There are small-scale hydroponic schemes, growing mainly salad vegetables and herbs for the tourism market.

Anguilla has an extensive wetland system of 26 sites spread across the mainland, Dog and Scrub Islands, and these are a striking feature of the Anguilla landscape. Elsewhere, there is little surface drainage with water permeating the limestone rocks and through systems of caves and caverns. The wetlands range in size from small, seasonal pools to larger, though still shallow, permanent ponds. The biggest are Caul's Pond, Cove Pond and Road Salt Pond at 35–45 ha in extent. Water levels are replenished through rainfall and run-off from catchments and freshwater springs. All are brackish to an extent, a result of direct saltwater intrusion from seepage through the limestone or from storm surges into coastal lagoons.

Four wetlands are found inland: Badcox, Caul's, East End and Mimi Bay Ponds. These

spring- and rainfall-fed ponds have formed in the few shallow depressions in the limestone and have attracted the largest flocks of waterfowl in recent years, particularly Blue-winged Teals *Anas discors* in winter. The remaining larger ponds are coastal lagoons where, over time, sand has drifted and deposited, forming beaches, dunes and bars, effectively converting once shallow lagoons into enclosed ponds. In periods of low rainfall these lagoons dry out, with impacts on both salinity and invertebrate populations.

Dry, evergreen scrub hems in most of the coastal lagoons on the landward side but at the margins and the coastal edge, a variety of plants can be found in brackish water and coastal dunes, including Pondweed *Sesuvium portulacastrum*, Balsam *Croton flavens* and Sweet Weed *Stylosanthes hamata*. Perhaps the most dominant tree around the water's edge of many ponds is the Buttonwood *Conocarpus erectus*, a widespread terrestrial species of mangrove. Small areas of mangrove swamp remain on Anguilla with Red *Rhizophora mangle*, Black *Avicennia germinans* and White Mangrove *Laguncularia racemosa*. These are found on ponds that are slightly deeper and more likely to hold water year-round, such as Little Harbour Pond. All of this vegetation provides critical resting, foraging and nesting grounds for a range of wetland resident and migratory birds, far more than would be expected for an island so dry and so small.

Anguilla's coastline is mostly low, fissured limestone interspersed with long stretches of white sand beaches, which have provided a basis for its increasing tourism industry. A number of coral reefs are found in shallow seas and some lie close to the shore, in places like Shoal Bay East. In a few areas such as Forest Bay, Little Bay and Island Harbour, beds of turtle grass *Thalassia testudinum* are found, attracting a range of herbivorous fish and the Endangered Green Turtle *Chelonia mydas*. The reefs surrounding the northern coast of the island also provide important foraging grounds for the Critically Endangered Hawksbill Turtle *Eretmochelys imbricata*. The cliffs that line this coast are the highest on Anguilla, with sandstone cliffs at Crocus Bay and limestone cliffs at Little Bay, where White-tailed *Phaethon lepturus* and Red-billed Tropicbirds *P. aethereus* breed.

Important Bird and Biodiversity Areas (IBAs) on Anguilla

There are currently 16 IBAs identified on Anguilla, 12 on the main island and four on the smaller islands (fig. 1). The main seabird colonies qualify under the global congregations criterion (A4ii), sites supporting >1% of the global population of a seabird species (A4ii) or the regional congregations criterion (B4ii), sites supporting >1% of the regional population of a seabird species. In addition, Dog Island qualifies under criterion A4iii, sites supporting $\geq 10,000$ pairs of seabirds of one or more species. Global and regional population estimates are taken from Important Bird Areas in the Caribbean (BirdLife International 2008).

The seabird colonies have consistently met the regional congregations criterion although Laughing Gulls *Larus atricilla*, Bridled Terns *Onychoprion anaethetus* and Roseate Terns *Sterna dougallii*, which have all reached 1% of the global population, have been recorded in lower numbers in recent years. The 1% global thresholds for Brown Booby *Sula leucogaster* (2,000 birds) and Sooty Tern *O. fuscatus* (28,600 birds) have consistently been reached (BirdLife International 2008). Ongoing surveys confirm the global and regional importance of the seabird populations on Anguilla, although providing accurate trends is difficult since the main surveys are often incomplete due to access difficulties. The most up-to-date surveys are from 2013; see table 1, p. 460.

On the mainland, the IBAs qualify either under criterion B4ii for their populations of Least Terns *Sterna antillarum* or under A2 for assemblages of restricted-range species. These sites are known or thought to hold a significant component (two or more) of the restricted-range species whose breeding distributions define an Endemic Bird Area (EBA). The Lesser Antilles Endemic Bird Area (EBA 030; Stattersfield *et al.* 1998) extends across all the island groups in the Lesser Antilles from Anguilla to Grenada. The key habitats are

lowland and montane rainforest, dry forest and elfin forest. The EBA is defined by 38 restricted-range species of which five occur in Anguilla's dry forest: Green-throated Carib *Eulampis holosericeus*, Antillean Crested Hummingbird *Orthorhyncus cristatus*, Caribbean Elaenia *Elaenia martinica*, Pearly-eyed Thrasher *Margarops fuscatus* and Lesser Antillean Bullfinch *Loxigilla noctis*. All these species are widespread in the EBA and of Least Concern.

The main seabird colonies are all recognised as IBAs. **Sombrero IBA** is a remote, flat-topped rocky island, 38 ha in extent and 55 km northwest of Anguilla. The island's vegetation is currently in the early stages of recovery following damage by Hurricane Luis in 1995. Extensive phosphate deposits were mined in the nineteenth century leaving the island's surface pitted with craters up to 10 m deep. The island lies on a route where European shipping enters the Caribbean, an area with hazardous reefs. A lighthouse there was built by the British and operational from 1868; the light was automated in 2001 and now the only visitors are occasional fishermen, sailors, divers and researchers.

The island has long been important for its breeding seabirds. Currently, seven species breed and it is listed as globally important for Bridled Terns; up to 810 individuals have been recorded, although fewer in recent years. Sombrero holds regionally important populations of Brown Booby, Masked Booby *Sula dactylatra* and Brown Noddy *Anous stolidus*.

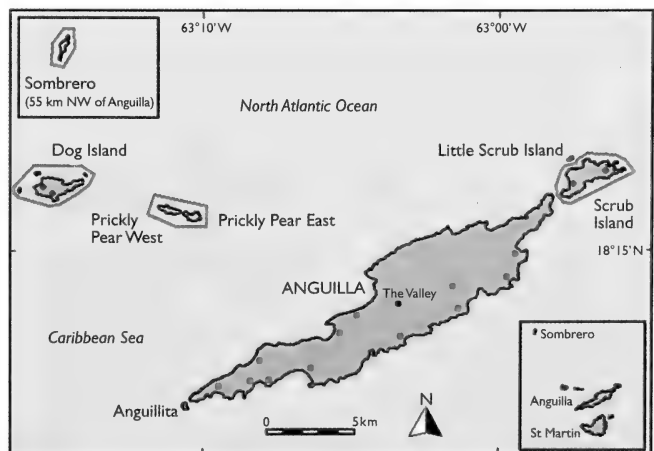


Fig. 1. Important Bird Areas on Anguilla. Note that red dots/lines show IBA locations, rather than actual boundaries.

Colin Wilkinson

Dog Island IBA lies 13 km northwest of the mainland and is a rocky island of 207 ha with three smaller islands off its west and north coasts. The coastline comprises low cliffs interspersed with sandy beaches. Weathered limestone rocks reach sea level in some areas and there are two large ponds inside beaches at Spring Bay and Stoney Bay. The centre of the island is covered in impenetrable, low, thorny scrub and cacti. A herd of feral goats is a remnant of previous periods of livestock farming.

Dog Island is a magnificent seabird island and holds globally important populations of Brown Booby (several annual counts of over 1,000 pairs) and Sooty Tern (a recent census estimated the population at over 135,000 pairs). Among ten breeding seabirds, Red-billed Tropicbird, Magnificent Frigatebird *Fregata magnificens*, Masked Booby, Laughing Gull, Bridled Tern and Brown Noddy all occur in regionally important numbers. Along with Barbuda, the island is one of two breeding sites in the Lesser Antilles for Magnificent Frigatebird, with 518 pairs in 2013. Four pairs of Audubon's Shearwater *Puffinus lherminieri* were found in 2013, adding to a recent breeding record on Little Scrub Island. Lowrie et al. (2012) found Dog Island to be the second most important

site for breeding seabirds in the Lesser Antilles. Following an eradication operation in 2012, the island has now been declared rat-free and monitoring is in place to track the impact of this on its seabirds.

Prickly Pear East and West IBA comprises two islands, 63 ha in total, separated by a narrow channel, lying 8 km north of the mainland. Prickly Pear West is the more rugged and, apart from one small beach, is a low limestone outcrop. Prickly Pear East is also low and rocky with areas of scrub at its centre. A small pond lies behind beaches on its northern shore.

The IBA is listed as globally important for the Laughing Gull (an estimated 2,500 pairs in 2004) and regionally important for Red-billed Tropicbird, Brown Pelican *Pelecanus occidentalis*, Brown Booby and Least Tern.

Scrub Island IBA is the largest of Anguilla's outer islands at 348 ha and is separated from the northeast corner of mainland by a channel 500 m wide. The island is low-lying with scrub at its centre stretching to the coastline of low cliffs and fissured limestone. There are four sandy beaches, a large pond and a complex of lagoons on the eastern coast, providing suitable breeding areas for gulls and terns.

The island is particularly important for



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254. Scrub Island IBA, viewed from Windward Point, September 2011.

breeding seabirds and the IBA currently lists it as globally important for Laughing Gull and Roseate Tern, although recent surveys show that both species have declined. The island is one of few regular breeding sites in Anguilla for Royal *Sterna maxima* and Cabot's Terns *S. aculeata*.

The 12 mainland IBAs are all centred on ponds, except for Katouche Canyon, which holds the most extensive area of mature dry forest (32 ha). The IBAs range in size from 3 ha to 43 ha and seven are listed for breeding Least Terns: Cove, Grey, Long Salt, Road Salt, Caul's, Rendezvous Bay and Meads Bay Ponds. Regular transects through areas of mangrove and dry forest around ten mainland IBAs and on Scrub Island have identified these as important areas for two or more of Anguilla's five restricted-range bird species within the Lesser Antilles EBA.

Seabirds

Anguilla's islands are, essentially, seabird islands. Look out from any mainland beach at any time of year and you will see Brown Boobies, Brown Pelicans, Magnificent Frigatebirds and Royal Terns. The islands form a first landing point for pelagic species from the Atlantic and provide both shallow seas for feeding and generally undisturbed



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255. The Long Salt Pond IBA, Anguilla, February 2013. Note the salt flats, which provide nest sites for Least Terns *Sterna antillarum* and Snowy Plovers *Charadrius nivosus*, the old salt pond walls and also the encroaching housing.



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256. Snowy Plover *Charadrius nivosus*, Anguilla, October 2006.

islands for breeding. Since 2000, 16 species of seabirds have been recorded breeding, out of 17 current breeders in the Lesser Antilles. The remaining species, Common Tern *S. hirundo*, has been recorded in the breeding season on Anguilla but not proven to breed.

The islands have long been famous for their seabirds but only in recent years have systematic counts confirmed their status as one of the most important seabird areas in the Caribbean. Counts were initiated in 1998–2000, in response to a proposal to build a rocket launching base on the remote island



257. Red-billed Tropicbird *Phaethon aethereus* on a nest on Dog Island, Anguilla, May 2007.

of Sombrero. That proposal was ultimately withdrawn but with continuing support from the RSPB, Environmental Protection in the Caribbean (EPIC) and the University of Liverpool, ANT and DoE have been carrying out more regular surveys to build a clearer picture of the bird populations on the islands. This monitoring has contributed to the identification of IBAs and provided data for EPIC's seabird atlas of the Lesser Antilles (Lowrie *et al.* 2012). There is now a basis for regular monitoring to track population trends and inform conservation action.

Red-billed Tropicbirds are found mostly on Dog Island and Prickly Pear West, where they nest under boulders or within crevices. These sites held 64 and 63 pairs respectively in 2013, globally important numbers (Bright *et al.* 2014). Small numbers of White-tailed Tropicbirds have been found breeding since 1999, with a maximum of five pairs on cliffs at Little Bay on the mainland in 2007.

The Brown Booby is one of the most familiar seabirds on Anguilla and both adults and immatures can be seen throughout the year. The population has exceeded 2,000 pairs (or apparently occupied nests, AON) in four main colonies: Dog Island, Prickly Pear East and West and Sombrero. Smaller numbers of Masked Boobies can be found among these

colonies, with numbers reaching regionally important levels on Dog Island and Sombrero. Up to two breeding pairs of Red-footed Boobies *Sula sula* were present on Prickly Pear West during 1998–2000.

The Sooty Terns on Dog Island nest among dense, low thorn scrub and have proved difficult to census. A survey by ANT and RSPB in 2007 estimated the population at over 113,000 pairs, the largest in the Caribbean (Wilkinson *et al.* 2012), while the 2013 census estimated over 135,000 pairs. Sooty Terns also breed in smaller numbers on Sombrero. Visitors should take a boat trip around Dog Island or Sombrero to guarantee seeing Sooty and Bridled Terns, as these species are rarely seen from the Anguilla mainland.

The Least Tern is found in small numbers on three islands, with larger numbers on the mainland IBAs. Overall, Anguilla is regionally important for this species, holding around 6% of the regional population in 2007, with Long Pond IBA the most important site. All these mainland sites are IBAs but are prone to disturbance from visitors and vulnerable to predation by feral dogs. These sites would benefit from seasonal measures to reduce disturbance, for both Least Terns and the breeding Snowy Plovers *Charadrius nivosus*,

which are Near Threatened.

The main breeding season for seabirds is from April to July when Laughing Gulls and all of the terns, other than resident Royal Terns, arrive on the islands. Brown and Masked Boobies have more extended breeding seasons and may breed year-round, with several peaks in breeding numbers throughout the year. Surveys show considerable variation in the breeding numbers of terns owing to low breeding site fidelity, making it difficult to detect long-term trends. Roseate Terns were surveyed on Scrub Island in 1999 and 2000, when up to 210 pairs were present. Cabot's, Royal and Least Terns also breed there, although numbers appear to have declined since the 1990s. Roseate Terns are also known to breed at sites to the west, in the Virgin Islands.

Current research mostly involves monitoring to get a clearer picture of population trends. In addition, a two-year project funded by the UK Government's Overseas Territories Environment and Climate Fund (Darwin Plus) was implemented between 2013 and 2015 on Anguilla and the British Virgin Islands (BVI), to identify important feeding areas for seabirds using GPS tracking devices. This follows on from pilot work on Dog Island in 2012, where 20 Brown Boobies were

tracked in Anguilla and were found to travel up to 200 km on their foraging trips. This project aims to track both globally and regionally important seabird populations within the region. The work will eventually provide new information on the feeding ecology of five species of seabird and help to identify important feeding areas, which can inform marine planning in the area. A further project, funded by the Leverhulme Trust, is due to commence in April 2015, with the aim of examining the asynchronous breeding of tropical seabirds using Brown and Masked Boobies breeding on Dog Island as model species.



Mike Pollard

258. Brown Booby *Sula leucogaster* nesting areas along the clifftops on the south coast of Dog Island, Anguilla, May 2007.



Mike Pollard

259. Brown Booby *Sula leucogaster* with chick, Dog Island, Anguilla, May 2007.

Table 1. Species and populations of seabirds breeding on Anguilla's IBAs in 2013 (from Bright et al. 2014, with modifications).

	total breeding pairs 2013	Dog Island IBA	Prickly Pear East and West IBA	Scrub Island IBA	Sombrero IBA	other sites
Audubon's Shearwater	5	4				1
Red-billed Tropicbird	135	64	70	1		
White-tailed Tropicbird	n/c					
Brown Pelican	6		6			
Magnificent Frigatebird	518	518				
Masked Booby	137	67†			70	
Brown Booby	2,082	1,636†	365†		75	6
Brown Noddy	1,066	285	28		580	173
Laughing Gull *	2,378*	941	1,072	280	26	59
Royal Tern *	11*			5		6
Cabot's Tern *	7*			7		
Least Tern	499	39				460
Bridled Tern	338	27	34	12	218	47
Sooty Tern	135,761	135,746			15	
Roseate Tern *	106*			66		40
Common Tern	0					

* Denotes number of individuals, not breeding pairs.
† Two counts per year to cover asynchronous breeding.

Wetland birds

Anguilla's wetlands attract a wide range of the resident and migratory waterbirds found in the Caribbean. If water levels are right, they are spectacular wildlife sites. Thanks to monthly surveys conducted by ANT and visiting birdwatchers since 2007, a clearer picture is emerging of the status of these species. During 2007–13, Anguilla's wetland bird counts recorded a monthly average of 29 species and 1,894 birds. The peaks in both range of species and overall numbers occur during spring and autumn migration (Lloyd & Mukhida 2012).

The most familiar of the islands' breeding waterbirds are White-cheeked Pintail *Anas bahamensis*, Common Gallinule (American Moorhen) *Gallinula galeata* and Black-necked Stilt *Himantopus mexicanus*. These breed on most of the larger ponds and can be seen with young at some of the most accessible sites, such as Road Salt Pond and West End Pond. Less common breeders include Green Heron *Butorides virescens*, Yellow-crowned Night Heron *Nyctanassa violacea*, American Coot *Fulica americana*, Killdeer *Charadrius vociferus*, Snowy and Wilson's Plovers *C. wilsonia*, and Willet *Tringa semi-*

palmarum. Away from ponds on rocky coasts, several pairs of American Oystercatcher *Haematopus palliatus* also breed. A few species have been proved breeding for the first time in recent years: Ruddy Duck *Oxyura jamaicensis* and Cattle *Bubulcus ibis*, Snowy Egretta *thula* and Great White Egrets *Ardea alba*.

Migratory species following the Atlantic Flyway along the eastern seaboard of North America will arrive in the Greater Antilles, well to the west of Anguilla. This may explain why some herons, for example, become scarcer as you move east to islands in the Lesser Antilles. It is less clear how these species disperse across the Caribbean or use the wetlands as staging posts in migrations that take them on to Central and South America. The counts in Anguilla do provide evidence of birds moving through the region or between islands in search of suitable feeding conditions.

Some waders make direct flights south across the North Atlantic including Hudsonian Whimbrel *Numenius hudsonicus*, which has been tracked by satellite from breeding grounds on the Canadian tundra to wintering sites in the Caribbean. Small

numbers of Hudsonian Whimbrels winter on Anguilla. Other long-distance migrants that fly non-stop to wintering grounds in South America overfly the region unless grounded by tropical storms, including species such as Hudsonian Godwit *Limosa haemastica*, which is a rare autumn migrant on Anguilla.

From a conservation perspective, Anguilla's wetlands are too small to attract large populations of waterbirds. They are, however, regionally important for breeding Least Tern and also attract three Near Threatened waders: Snowy Plover (which breeds in small numbers around coastal ponds), Piping Plover *Charadrius melodus* (a scarce winter visitor) and Semipalmated Sandpiper *Calidris pusilla*, a regular passage and winter visitor typically seen in flocks of up to 100 birds. Caribbean Coot *Fulica caribaea* is a rare breeder to East End Pond on the mainland, while American Coot occurs as a regular winter visitor.

From late July, a range of waterbirds from North America stream into Anguilla's wetlands. Regular visitors include Blue-winged Teal, Pied-billed Grebe *Podilymbus podiceps*, Great Blue Heron *Ardea herodias*, American Golden Plover *Pluvialis dominica*, Grey Plover *P. squatarola*, Semipalmated Plover *Charadrius semipalmatus*, White-rumped *Calidris fuscicollis*, Least *C. minutilla* and Pectoral Sandpipers *C. melanotos*, Greater Yellowlegs *Tringa melanoleuca* and Short-

billed Dowitcher *Limnodromus griseus*. If water levels are suitable, large flocks gather, with peaks of over 600 Lesser Yellowlegs *T. flavipes* on Road Salt Pond, and 450 Stilt Sandpipers *Calidris himantopus* and 270 Semipalmated Sandpipers on Long Salt Pond. As with UK wetlands, time spent checking and counting waterbirds is leading to increased sightings of further species. American Wigeon *Anas americana*, Green-winged Teal *A. carolinensis*, Pintail *Anas acuta* and Shoveler *Anas clypeata* occur among the Blue-winged Teal flocks. Ring-necked Duck *Aythya collaris* and Lesser Scaup *A. affinis*, still only occasional visitors, have been observed more frequently in 2012 and 2013 on Caul's Pond and the Forest Bay Pond system. Red Knot *C. canutus*, Western Sandpiper *C. mauri* and Solitary Sandpiper *T. solitaria* are now considered regular visitors in small numbers. Recent rarities include Marbled Godwit *Limosa fedoa*, Hudsonian Godwit, Ruff *C. pugnax* and Wilson's Phalarope *Phalaropus tricolor*. The wetland bird counts have also found small wintering populations of Sora *Porzana carolina* and Belted Kingfisher *Megaceryle alcyon*. Among the more surprising records are a Long-tailed Duck *Clangula hyemalis*, seen in 2008 on Merrywing Pond in the aftermath of Hurricane Omar, the first for the Caribbean (Mukhida *et al.* 2011), and two records of Snow Goose *Anser caerulescens*, in 2005 and 2011.



Gillian Holliday

260. The Black-necked Stilt *Himantopus mexicanus* is a regular breeding species on Anguilla, and can be found at most ponds in the islands; September 2011.

As many of the salt ponds and coastal lagoons are bordered by roads and buffered by only thin strips of vegetation, wetland birds are never very far from people. The Government of Anguilla and ANT are exploring ways in which these vibrant bird communities and natural wetlands can form an increased part of what tourism can offer on the island.

Landbirds

Anguilla's breeding landbirds are restricted to 14 regular species, most of which can be observed and heard almost anywhere around the mainland. The areas of dry forest and scrub are limited in height and extent on the smaller islands with only Scrub Island and Dog Island holding more than a handful of breeding species.

Both Green-throated Carib and Antillean Crested Hummingbird are making a comeback after virtually disappearing from the island after Hurricane Luis in 1995. Strong winds and salt spray had a devastating effect on the island's vegetation and severely reduced food sources for the hummingbirds. Recent transect and point-count monitoring by ANT show that populations of both species are increasing, particularly close to

ponds and more forested areas.

Caribbean Elaenia is a widespread breeding bird of the open, dry limestone scrub, while the Pearly-eyed Thrasher can be seen in gardens and around hotels but reaches its highest densities in the remaining areas of dry forest. The thrasher takes a wide range of food, mainly fruits and seeds but also live prey, including by nest predation. Lesser Antillean Bullfinches can be elusive but are typically found around taller areas of dry forest and scrub including in gardens.

The Near Threatened White-crowned Pigeon *Patagioenas leucocephala* bred on the island up to the 1960s but is now only a rare visitor, with a single bird seen in 2005 and none recorded since. Habitat loss and degradation and hunting pressures are driving its decline in the region. The reduction in mangrove habitat for breeding and the loss of taller dry forest may also be limiting factors for recolonisation.

Among the remaining species are several that are widespread across the Caribbean. American Kestrel *Falco sparverius* is the only breeding raptor and Zenaida Dove *Zenaida aurita* was recognised as Anguilla's national bird in the 1990s. The others are Common Ground Dove *Columbina*



261. Male Lesser Antillean Bullfinch *Loxigilla noctis*, Anguilla, September 2011.

passerina, Grey Kingbird *Tyrannus dominicensis*, Yellow Warbler *Setophaga petechia*, Bananaquit *Coereba flaveola* (the most abundant and noisiest of Anguilla's land-birds) and Black-faced Grassquit *Tiaris bicolor*. Less easy to see is the Antillean Nighthawk *Chordeiles gundlachii*, thought to be a visitor to Anguilla in the breeding season, from April to September. Little is known of this species on Anguilla but its 'quer-a-be-be' calls can be heard at dusk over several areas of undisturbed scrub and headland. A nest with an egg was found by ANT in 2013. Mangrove Cuckoo *Coccyzus minor* is a local resident easily seen around wetlands but also occurs throughout the limestone scrub.

A range of introduced species are spreading across the Caribbean Islands. The Collared Dove *Streptopelia decaocto* reached Anguilla as a breeding species in 2005 and the House Sparrow *Passer domesticus* has colonised a small area of Island Harbour since 2002, with further birds found on Dog Island in 2012.

From September through to April, one of the highlights for birdwatchers is encountering a North American landbird, whether migrating or wintering. Wintering birds are scarce but over the past decade small numbers of Prairie Warblers *Setophaga discolor* and Northern Waterthrushes *Parkesia noveboracensis* have been found in mangrove areas around ponds such as Little Harbour, and Black-and-white Warblers *Mniotilta varia* in the dry forest areas in Crocus Bay and Katouche Canyon. In all, 16 species of American warblers have been recorded in the past 20 years with the sheltered Katouche Valley being the best site. The most common passage migrant through Anguilla is the Barn Swallow *Hirundo rustica*, seen in all months except May–July.

Anguilla has a growing list of vagrants, and its location makes it a potential first landfall for species moving south over the Atlantic. A thunderstorm in October 2006 grounded at least ten Yellow-billed Cuckoos *Coccyzus americanus*, 20 Common Nighthawks *Chordeiles minor*, Anguilla's first Chimney Swift *Chaetura pelagica* and several Blackpoll Warblers *S. striata* (Holliday *et al.* 2007).

Other important flora and fauna

There is still much to discover about Anguilla's biodiversity. A recent assessment of biodiversity in the UKOTs recorded numbers of native and non-native species and assessed endemic species for their IUCN Red List threat status (Churchyard *et al.* 2014). This confirmed that while good data were available for Anguilla's vertebrates and plants, the knowledge of insects, marine invertebrates, fungi and lichens was poor. A total of 761 native and 216 non-native species was recorded, of which 420 and 196 respectively were plants.

Many of the 420 native plants are widespread across the region. The only endemic is the Anguilla Bush *Rondeletia anguillensis*, a small, spiny shrub that grows in limestone areas in the north and east (Walker *et al.* 2005). New species continue to be introduced, with a recent increase in exotics imported for landscaping.

Anguilla has one of the most important and largely unbroken reefs in the eastern Caribbean, and its coastal and maritime biodiversity is the islands' most important natural feature. The islands are important for sea turtles, all of which are under threat. Hawksbill and Green Turtles haul themselves out of the water to lay eggs on the less disturbed beaches on Anguilla, Dog Island, Prickly Pear East and West and Scrub Island. These are occasionally joined by the Vulnerable Leatherback Turtle *Dermochelys coriacea*. ANT has established the Anguilla Sea Turtle Conservation Group, which is recruiting volunteers to help with monitoring of beaches on a weekly basis through the breeding season.

Several species of reptiles are found on the islands with the ground lizard *Ameiva plei* the most widespread and easy to see in areas of dry forest and scrub on four islands including the mainland. Two further *Ameiva* species, *A. corax* and *A. corvina*, are endemic to Little Scrub and Sombrero respectively, where their populations are small and classified as Vulnerable (Hodge *et al.* 2003).

Two species of reptile are less easy to see: the Endangered Lesser Antillean Iguana *Iguana delicatissima* and the Anguilla Racer snake *Alsophis rijgersmaei*. Iguanas are found on cliffs and dry scrub along the northern

coast. The Lesser Antillean Iguana is found throughout the northern Lesser Antilles but on Anguilla the population is small and perhaps declining – and it may come under threat from the recently introduced Green Iguana *I. iguana*. The Anguilla Racer is restricted to four islands on the Anguilla bank, including Anguilla and Scrub Island, where it feeds on lizards and introduced amphibians.

Bats are the only native land mammals in the Lesser Antilles and six species are found on Anguilla: Miller's Long-tongued Bat *Monophyllus plethodon*, Antillean Fruit-eating Bat *Brachyphylla cavernarum*, Brazilian Free-tailed Bat *Tadarida brasiliensis*,

Jamaican Fruit-eating Bat *Artibeus jamaicensis*, Mexican Funnel-eared Bat *Natalus stramineus*, and Pallas's Mastiff Bat *Molossus molossus*. Limestone caves are important roosting and breeding sites for several species, with recent studies locating 13 sites across the mainland.

The threats to birds and biodiversity

Anguilla's biodiversity faces many threats, which loom larger with each passing year. Principal among these are habitat loss, pollution, climate change, invasive non-native species and the effect of high-impact natural events.

Box 1. Getting to Anguilla and how to contribute records

Most visitors arrive by ferry from the port of Marigot on nearby St Martin/St Maarten with the crossing taking around 20 minutes. There are also flights from some of the main hub airports of the eastern/northern Caribbean including Antigua, Puerto Rico and St Martin/St Maarten.

The peak months of tourism activity are from December to April. A range of activities and events are held throughout the year with a Carnival and Summer Festival in July and August, including Boat Race week in August.

Anguilla is still gathering and building datasets to support its environmental policies and planning, and to conserve its natural resources. Responsibility and action on survey and monitoring is led by ANT and DoE. If you are planning to visit the islands, it is worth contacting both organisations in advance: Anguilla National Trust at axanat@anguillanet.com, DoE at karim.hodge@gov.ai

There is a developing programme of seabird monitoring and a new Seabird Monitoring Field Guide has been produced by the University of Liverpool and ANT, with support from RSPB and UK Government funding from the Darwin Plus Initiative. This sets out agreed survey protocols, so that ad-hoc observations can supplement occasional full surveys. Access to the main seabird breeding islands can be difficult so again it is worth contacting ANT or DoE in advance, in case you can participate in planned surveys. This not only helps the survey teams but can also provide a memorable experience of visiting some fantastic seabird colonies. Getting on and off the islands can be tricky since there are no jetties, so be prepared for getting wet and protecting optical and photographic equipment. If you are visiting the main island of Anguilla between April to July, you can help with monitoring breeding tropicbirds and Least Terns. ANT also appreciates help with monthly wetland bird counts and these provide an excellent opportunity to visit a range of wetlands. These counts form part of the Caribbean Waterbird Census, coordinated by BirdsCaribbean (formerly The Society for the Conservation and Study of Caribbean Birds – SCSCB).

Finally, and whenever you visit, you can log all your sightings with eBird: <http://ebird.org/content/caribbean>

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As Anguilla and other Caribbean islands have become more popular as tourism destinations, pressure for new development has increased, especially in coastal areas. Property developments currently threaten several of the main island's salt ponds and even off-shore islands to some degree. Some ponds have already been partially filled for coastal development and building continues to encroach on catchments and pond margins. Aside from the immediate loss of biodiversity, much of the development on or around coastal wetlands directly affects soft defences, such as sand dunes and mangrove swamps, as well as their capacity to act as flood storage areas. These trends are unlikely to be sustainable or resilient to the effects of climate change. The islands are also threatened by potential infrastructure development, with proposals suggested for both Dog Island and Scrub Island in recent years. Terrestrial and coastal land-use change, including development along the northern coast, is putting further pressure on populations of the native iguana. It is a similar picture for the endemic Anguilla Bush, with permission being given for new housing development within its limited range. Sea turtles are also losing nesting grounds as a result of ineffective enforcement and protection.

The growth in tourism also brings with it an increase in waste and pollution. Coastal developments create environmental concerns, notably from improper or inadequate wastewater disposal and greater erosion, leading to increased freshwater run-off and sediments entering the fragile marine environment. Anguilla's porous limestone and aquifers are also vulnerable to recent increases in pesticide and herbicide use and this could, if unchecked, cause further problems for the island's ecosystems and biodiversity.

Introduced, invasive non-natives such as mice, rats and feral cats have largely restricted breeding seabirds on the mainland to a few inaccessible cliff sites. A recent study prioritising islands for the eradication of invasive vertebrates in the UKOTs highlights the scale of the challenge on larger islands, with 18 species of invasive vertebrates recorded on Anguilla alone (Dawson *et al.* 2014). The study also placed Dog Island in

the top 25 islands ranked by eradication benefit, which assumes feasibility of the techniques for the species involved. It is encouraging that the recent rat eradication programme on Dog Island has been successful, benefiting its internationally important populations of breeding seabirds. At least two further IBAs on smaller islands have had rats introduced in the past.

Anguilla continues to be vulnerable to natural events, including occasional droughts and hurricanes. Hurricanes are a feature of the climate and their impact can be devastating for people and nature, although for many species the impacts appear short-lived. A recent climate change study for the region suggests that hurricane events may become less frequent but more intense.

Ultimately, the conservation of Anguilla's biodiversity lies in the hands of the people of this small island nation. A strong political will, suitable policies and a commitment to act on these are needed to achieve appropriate conservation measures to protect Anguilla's vulnerable biodiversity. Political action needs and depends above all on an environmentally conscious public and voting electorate. There is a great need for continuous environmental education in both formal and informal sectors to build more support for nature. The coming years will be pivotal in Anguilla's ability to achieve a sustainable future for the benefit of Anguillians, visitors and the wonderful bird populations and biodiversity found there.

Endnote

ANT and DoE continue to work on a number of projects that build on recent programmes. From a seabird conservation perspective, work continues on a biosecurity and biodiversity monitoring project on Dog Island and, building on this, ANT and the RSPB are carrying out a feasibility study to remove rats from Prickly Pear East and West IBA. Site protection will continue to be a challenge for Anguilla, but there is a project to enable the first RAMSAR sites to be declared on the islands. An ongoing wetland assessment programme should provide data to support casework emerging from development proposals affecting the mainland IBAs.

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Home range, habitat use and diet of Honey-buzzards during the breeding season

Fridtjof Ziesemer and Bernd-Ulrich Meyburg

Abstract Four adult male Honey-buzzards *Pernis apivorus* were fitted with GPS satellite transmitters in northern Germany. The tags were deployed during the nestling period and the birds followed until they started their autumn migration. For one male, data were also collected throughout the following breeding season. The four birds occupied home ranges that varied between 13.5 and 25.8 km². The birds spent most of their time in woodland and apparently found most of their food there: of 35 wasp and two bumblebee nests that were found, 78% were in woodland. In all, 99% of the locations received from the four males were within a radius of 4 km of the nest. The birds roosted at different sites, some of which were close to the nest, but sometimes close to wasp nests that had not been fully exploited. As the young developed, the males visited new areas for foraging, and spent more time farther from the nest. The most frequently recorded food item was the Common Wasp *Vespula vulgaris*. Possible effects of the recent changes in the occurrence patterns of key wasp species, especially the German Wasp *V. germanica*, are discussed.

The generally secretive Honey-buzzard *Pernis apivorus* is a difficult species to monitor effectively in its European breeding areas. In the past decade or so, the European population was estimated at 110,000–160,000 (BirdLife International 2004) or approximately 130,000 breeding pairs (Mebs & Schmidt 2014), although population estimates should be viewed with caution. In Europe as a whole, the population is believed to be stable (BirdLife International 2004), yet an analysis of breeding populations, productivity and survival rates provides clear evidence of population declines in some areas, including parts of its range in northwest Europe (Bijlsma *et al.* 2012).

The factors influencing this decline could operate on the breeding grounds, on migration and/or in the birds' winter quarters, in West and Central Africa, where forest destruction

continues at a rapid rate (Martin 1991; Oates 1999). Continuous tracking of a number of individual birds throughout the year may help to identify problems and determine where they are occurring. Between 2001 and 2011, we fitted solar-powered satellite transmitters (platform transmitter terminals, or PTTs) of various types, weighing 18–22 g, to 12 adult Honey-buzzards in Germany. (For more information on the technique of satellite tracking, see Meyburg & Fuller (2007) and Meyburg & Meyburg (2007, 2009, 2013).) From 2009 onwards, we were able to use transmitters that gave precise GPS fixes, and these provided the bulk of the information reported here, which relates to the breeding season only.

Study area and methods

Our studies were carried out in eastern Schleswig-Holstein (the most northerly

German federal state), an undulating, agricultural landscape with heights between 20 and 80 m above sea level. Most of the farmland is arable, but there is some grassland, managed by a combination of grazing and silage. The fields, on the mainly sandy/clay soils, are often separated by banked hedgerows (an earth bank, with hedgerow planted along the top) interspersed with numerous patches of woodland. In a rectangular area of 630 km² that encompassed the home ranges of all the Honey-buzzards studied (mid-point 54.22°N 10.43°E), the proportion of woodland was 15% while the total length of banked hedgerows (as an indicator of the density of boundary lines) was 2,945 km, or 4.7 km/km². Most of the woodland is managed for timber, and deciduous trees (notably Beech *Fagus sylvatica*) predominate; in the area of 630 km² referred to above, 47% of the woodland is mixed, 40% is deciduous and 13% coniferous.

We fitted seven adult Honey-buzzards (three females and four males) with solar-powered GPS PTTs between 2009 and 2011. All birds were captured close to the nest during the nestling stage. Since the females spend a great deal of time near the nest while brooding small nestlings and in general spend little time in the sun during the breeding cycle, the solar cells did not provide sufficient charge for a usable amount of data

Table 1. Number of fixes per day for the tagged male Honey-buzzards.

	Argos transmitter ID number	fixes/day	
		range	mean
male 1	95770	8–17	12.2
male 2	95771	10–19	15.4
male 3 (2010)	52033	0–9	2.1
male 3 (2011)	52033	0–13	3.8
male 4	68561	0–19	2.9

to be collected from females. However, sufficient data were obtained from the four males to measure various attributes of their home range and behaviour. Data were collected from the beginning of the day after the transmitters were fitted until the birds' departure from the breeding area.

The transmitters used in 2009 (birds 1 and 2) broadcast two-dimensional (2D) coordinates. In 2010 and 2011, the three-dimensional (3D) transmitters fitted to birds 3 and 4 also provided information on height above sea level as well as flight speed and direction. Because 3D transmitters require more power than 2D transmitters, they provided markedly fewer fixes when the bird was not in direct sunlight (table 1). According to the manufacturers, Microwave Telemetry, these tags are accurate to within ± 18 m for longitude and latitude, ± 22 m for height and



262. A view over the Plön region of Schleswig-Holstein, Germany, in August 2009 – part of the home range of Honey-buzzard *Pernis apivorus* male no. 1 in this study.



Fridtjof Ziesemer

263. A typical field boundary in Schleswig-Holstein, comprising a banked hedgerow where a wasp nest has been excavated by a Honey-buzzard *Pernis apivorus*; August 2009.

± 1 km/h for speed when this exceeds 40 km/h.

Fixes from the birds' daytime activity phase were plotted to calculate the home range and other parameters. The local times of sunrise and sunset were used to determine the overnight roost sites. If the bird's first morning movement was more than 80 m from the roost, the start of the daily activity phase was assumed. Conversely, the first fix from the overnight roost was taken to represent the end of the daily activity phase.

Data from the nestling period are available for all birds. Male 3 returned the year after it was tagged, again bred successfully at the same nest and was tracked throughout the breeding period in this year.

Various models were tested to provide the most accurate representation of home range. Home ranges can be represented as boundaries of the fix locations (Minimum Convex Polygon, or MCP; Kenward 2001). An MCP is the smallest polygon with outer angles $>180^\circ$ which encloses a defined percentage of all fixes. In order to exclude occasional excursions to distant areas, which would greatly increase the size of the MCP, it is standard practice to include only the closest 95% of fixes in the calculation (MCP 95). Some

authors also calculate the MCP 80, to illustrate the parts of the home range which are used most regularly. MCPs thus comprise a cluster of fixes, but do not tell us how those fixes are distributed within the home range. The most useful model proved to be the Kernel Density Estimation (KDE), which was used to map the utilisation distribution. This contour-based method is often used for mapping home ranges and evaluates utilisation distribution by generating high-density centres based on contour lines (Bowman 1985; Worton 1989). The dots represent the GPS fixes, the lines the kernel isopleths. The kernel isopleth lines mark the probability of occurrence: from 95%, 90%, 80%, 70% and so on down to 10% (and so the outside line encompasses 95% of the probable locations visited). Thus, the highest utilisation density is in the centre, decreasing towards the periphery.

We evaluated the GPS data with the software package GIS ArcView 3.2a. In addition, we used the Google Earth satellite photo program with diverse supplements for analysis. To evaluate the GPS fixes, the home range extension for ArcView© from Rodgers & Carr (1998) and the home range tools for ArcGIS© from Rodgers *et al.* (2007) were

used. These programs also calculate MCP. For MCP 95 and MCP 80, the Floating Amean method (proximity to recalculated mean of selected fixes) was used. Thereby the arithmetic mean of all fixes is calculated, then the most distant point determined and deleted, and once again the arithmetic mean of all remaining fixes established. This process is repeated until only 95% or 80% of the fixes remain. Google Earth Pro Version 7.1.2.2041 was used to create the maps, which are published on the basis of Google Order ID 577948 (licence holder B-U. Meyburg).

Here, we present the size of the home ranges as 95% KDE alongside the MCP that contains 80%, 95% or 100% of all fixes, in order to provide easier comparison with the results of other authors.

The extent of woodland within the birds' home ranges was assessed using the countryside information system of the Schleswig-Holstein State Office for Agriculture, Environment and Rural Affairs and maps produced by the Schleswig-Holstein State Survey Agency 2009. Where clusters of fixes indicated excavated wasps' nests, these were searched for, mainly within the following few days.

Table 2. Brood development and nesting phenology of the tagged Honey-buzzards.

	GPS data recorded	chick ringing data		derived phenology	
		date	age of first chick	first-egg date	first chick hatched
male 1	20.07–26.08.2009	22 July 09	19 days	1 June	3 July
male 2	19.07–29.08.2009	22 July 09	20 days	31 May	2 July
male 3 (2010)	08.08–24.08.2010	25 July 10	21 days	2 June	4 July
male 3 (2011)	19.05–13.08.2011	30 July 11	35 days	22 May	25 June
male 4	16.07–18.08.2011	30 July 11	25 days	3 June	5 July

Table 3. Size of home ranges (km²); see text for explanation of different measures used to define home range.

	KDE 95	MCP 80	MCP 95	MCP 100	no. of fixes	date range
male 1	17.3	9.7	12.3	28.7	456	20.07–26.08.2009
male 2	25.8	10.1	17.4	39.8	637	19.07–29.08.2009
male 3 (2010)	–	7.0	14.0	14.3	35	08.08–24.08.2010
male 3 (2011)	13.6	2.8	6.3	13.2	332	19.05–13.08.2011
male 4	13.5	3.1	6.4	9.2	100	16.07–18.08.2011

Table 4. The number of fixes in woodland and in other areas.

	woodland		non-woodland	
	no.	%	no.	total no.
male 1	387	85	69	456
male 2	558	88	79	637
male 3 (2010)	24	69	11	35
male 3 (2011)	367	94	25	392
male 4	81	81	19	100

Table 5. Woodland area (km²) and proportion of woodland (%) in the home ranges.

	KDE 95	%	MCP 80	%	MCP 95	%	MCP 100	%
male 1	2.4	13.9	2.0	20.5	2.4	19.2	3.8	13.4
male 2	5.4	21.1	2.4	23.5	3.9	22.4	7.6	19.2
male 3 (2010)	–		3.0	43.5	3.4	24.3	3.4	23.9
male 3 (2011)	3.0	22.2	2.0	71.2	3.8	60.7	4.7	35.9
male 4	1.8	13.1	0.9	28	1.4	21.2	1.5	16.7



Fig. 1. Home range of Honey-buzzard male 1 (95770), on the city limits of Plön (KDE; the outside line encompasses 95% of the probable locations visited, the inner lines represent 90%, 80% and so on down to 10%; see text for details). Dots: 456 GPS fixes between 20th July and 26th August 2009; red star denotes breeding site.

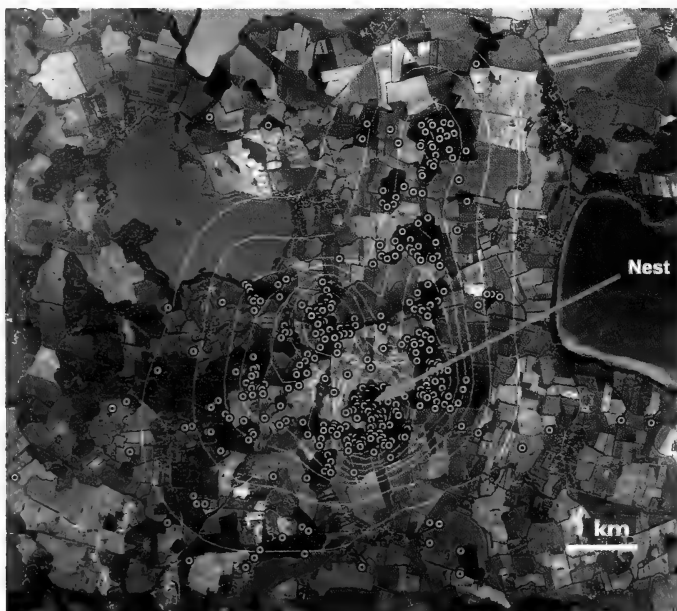


Fig. 2. Home range of Honey-buzzard male 2 (95771), to the west of the Selenter See (KDE). Dots: 637 GPS fixes between 19th July and 29th August 2009.

Results

Breeding data

Basic information on brood development and the period during which the GPS fixes were recorded is shown in table 2. The age of the chicks at the time of ringing was determined using the growth curve in Bijlsma (1997). The calculation of the first-egg date and hatching of the first chick is based on an assumed incubation period of 33 days from laying of the first egg, and a laying interval of two days (van Manen *et al.* 2011).

Home range and habitat selection

The sizes of the different home ranges varied between 13.5 and 25.8 km² (KDE 95%) (table 3, figs. 1–4). By far the greatest number of fixes (69–94%) were from woodland areas (table 4). This is much more than expected based on the proportion of woodland within the home ranges. For male 3, which nested in a woodland of 5 km², 61% of the home range was woodland, but the other three males had only around 20% of woodland within their home ranges (MCP 95; table 5). The male Honey-buzzards clearly preferred to remain in the woods, although they occupied a landscape where the woodland is highly fragmented.

The absolute size of the total area of woodland in the home range of the four Honey-buzzards varied between 1.8 and 5.4 km² (KDE 95%) and 1.4 and 3.9 km² (MCP 95%; table 5).

Diet

A cluster of fixes can suggest that a Honey-buzzard has exploited a food source at a particular location over several hours or even days. However, such food sources can be identified only if visible remains are left behind. The easiest of the regularly exploited food sources to find are the excavated nests

of ground-dwelling wasps. With three exceptions (one bumblebee *Bombus* and two Common Wasp *Vespula vulgaris* nests), all finds were in July and August. Additionally, during fieldwork, ten Common Wasp and two bumblebee nests were found by chance. One bumblebee and one wasp nest had been exploited by Honey-buzzards while two wasp

nests showed scratches but remained unharmed.

In total, 29 of 37 (78%) excavated wasp and bumblebee nests were found in woodland, four at the edges of pasture land (e.g. along fences, ditch lines), three in banked hedgerows and one in a harvested rape field, 5 m from a hedgerow (figs. 5–6, table 6).

Temporal and spatial use of home range

In total, 1,609 of the 1,620 fixes (99%) from the four males were within 4 km of the nest, including all overnight roosts. Male 1 flew up to 6.2 km from the nest, the greatest distance recorded. In general, however, the proportion of fixes for all four males decreased with distance from the nest (fig. 7). Birds were most often found in

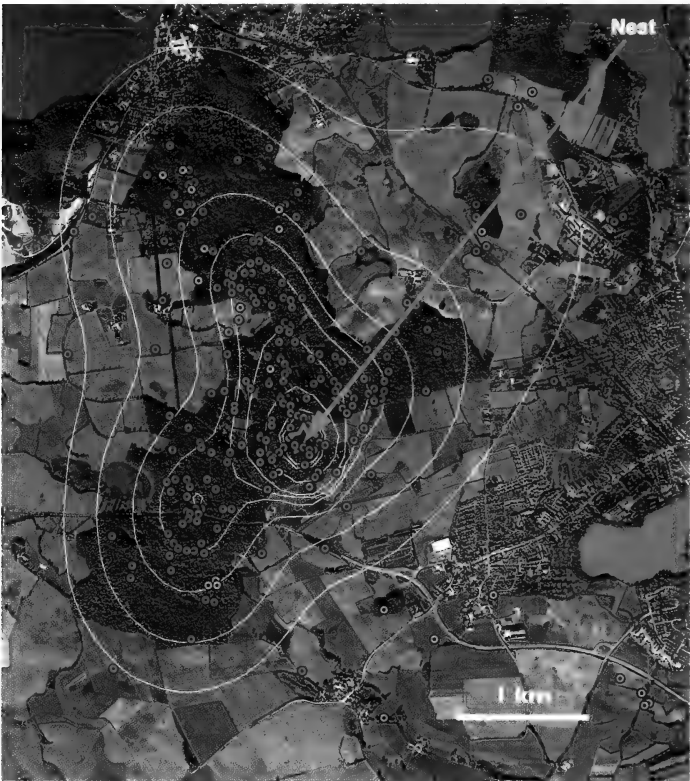


Fig. 3. Home range of Honey-buzzard male 3 (52033), near Eutin. Dots: 35 GPS fixes between 8th and 24th August 2010 (yellow) and 332 fixes between 19th May and 13th August 2011 (red, plus KDE contours).

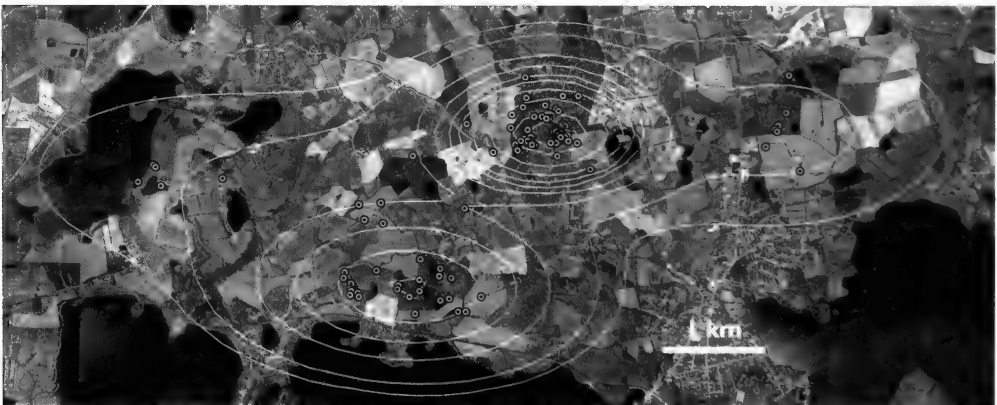


Fig. 4. Home range of Honey-buzzard male 4 (68561), near Malente (KDE). Dots: 100 GPS fixes between 16th July and 18th August 2011. Red star denotes breeding site.

Table 6. Wasp and bumblebee nests excavated by tagged Honey-buzzards.

	Common Wasp <i>Vespula vulgaris</i>	German Wasp <i>V. germanica</i>	bumblebee <i>Bombus</i>
male 1	10	1	0
male 2	11	1	0
male 3 (2010)	1	0	0
male 3 (2011)	6	0	1
male 4	5	0	1
Total	33	2	2

the woodland where their nest was located, with other concentrations of fixes in the nearest neighbouring woods.

At night, the distribution of fixes differed among individuals. Whereas male 1 often roosted close to the nest (within 250 m), males 2 and 3 seldom did so, instead roosting at various locations within their hunting area (but most commonly within 1 km of the nest; fig. 8). Occasionally, males 1 and 2 roosted close to wasp nests that had not been fully exploited. Only five night-roost fixes were recorded for male 4, and in 2010 only one night-roost fix for male 3, so that an evaluation of roosting behaviour in these cases was not possible.

For male 3, we were able to study the distances flown from the nest during all stages of the breeding season in 2011. This individual arrived in the breeding area on 19th May that year and on the morning of 20th May it was observed repeatedly chasing one or more rival males and flying with a female (similar to, and presumed to be the same as, its mate from 2010). The laying and incubation period (calculated back from the ringing dates of the young) began on 22nd May and ended on 25th June. The period during which the male had

to brood small chicks, at times when the female was away from the nest, was assumed to be from 26th June to 10th July. Male 3 left the breeding area on 13th August, when the first chick was about 49 days old, and the day after the second chick had been killed by a Northern Goshawk *Accipiter gentilis*.

During the pre-hatching period, almost half of the fixes from male 3 were from the nest and its immediate vicinity (40% within an 80-m radius, 47% within a 250-m radius around the nest). During the period in which the chicks had to be brooded, this proportion hardly changed (42% and 45% respectively). Thereafter, this male was more wide-ranging and active up to 3 km from the nest, so 23% and 28% of fixes were within 80 m and 250 m of the nest respectively (fig. 9).

As the breeding season progressed, the focus of the birds' activity shifted and they spent more time farther away from the nest (fig. 10). The most likely explanation for this pattern is the increased demand for food by growing nestlings, requiring the exploitation of more distant resources. Larger young require less protection from the adults and can be left for longer periods.

The nestling period has been reported as



264. An excavated wasp nest at the edge of a ditch in the study area; August 2009.

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Fig. 5. Wasp nests exploited by Honey-buzzard male 1 (95770): ten Common Wasp and one German Wasp (black star) nests, from 20th July to 26th August 2009. Red star denotes breeding site.



Fig. 6. Wasp nests exploited by Honey-buzzard male 2 (95771): 11 Common Wasp and one German Wasp (black star) nests, from 19th July to 29th August 2009. Red star denotes breeding site.

37–42 days in Honey-buzzards and the post-fledging period (the time between fledging and the young becoming independent) as 5–25 days (Bijlsma 2009). Of the three females and four males tracked by us, the first adult of each pair left the breeding area when the first chick was 44–49 days old, while the remaining adult left when the first chick was 46–58 days old. In two pairs it was the female that departed first. However, in two pairs observed in 1993 and 1995 respectively, one female and one male were the first to leave (Zieseimer 1997).

Diurnal activity patterns

As a rule, adult Honey-buzzards were already active at first light. On a few days they were more than 80 m from their overnight roost more than half an hour before sunrise, e.g. male 1 on six of 16 days and male 2 on four of 29 days. In contrast, male 3 (2011) was still at its overnight roost at sunrise on the 11 days for which data are available. Longer distances were sometimes flown early in the day. For example, on 8th August 2009, male 2 was at the nest 42 minutes before sunrise, after having spent the night 2 km away.

Hourly fixes were too imprecise to record the start and end of diurnal activity accurately. It was noticeable, however, that the birds became active early, often around first

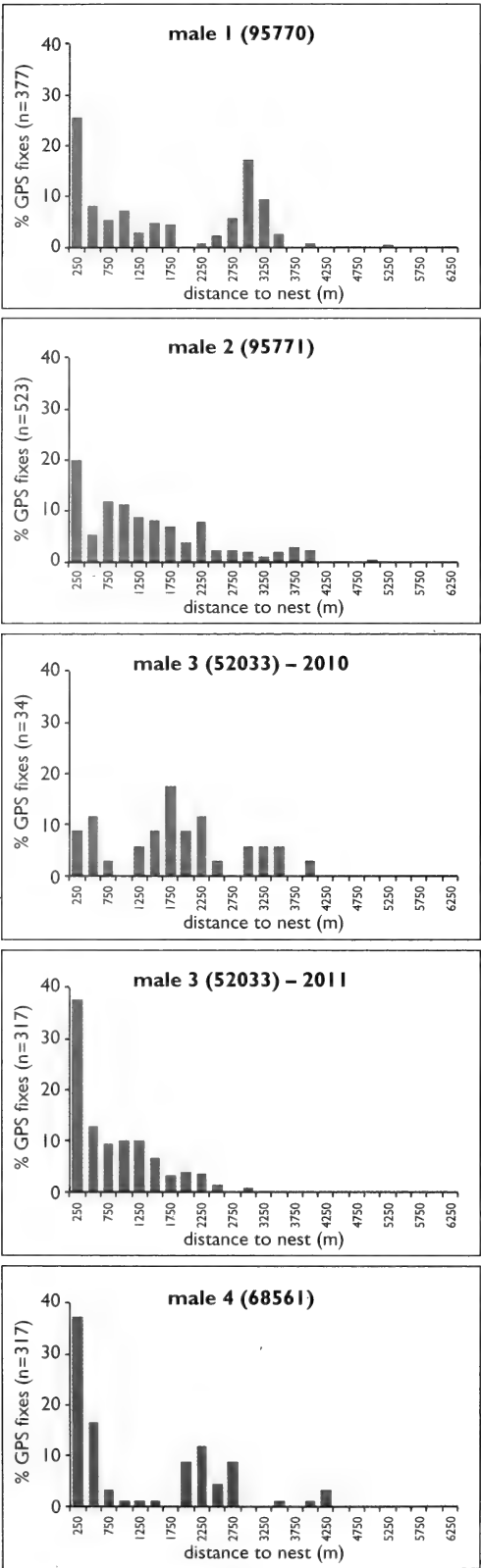


Fig. 7. Distance of daytime fixes from the nest.

light, although not on dark and rainy days. In addition, when a bird brooded overnight into the daylight hours, it left the nest only when relieved by its partner. It was also clear that birds ceased to be active towards sunset. Three males studied in the Netherlands ended their diurnal activity on average 28 minutes before sunset (van Diermen *et al.* 2009).

Honey-buzzards search for the nests of wasps and bumblebees by following their flight movements (Glutz von Blotzheim *et al.* 1971; Högestedt 1976). For example, the Common Wasp starts flying very early in the morning. At first, worker wasps that have spent the night outside the nest return, while soon after others begin to leave the nest. Thus on average, and depending on the time of year, activity can be higher in the early

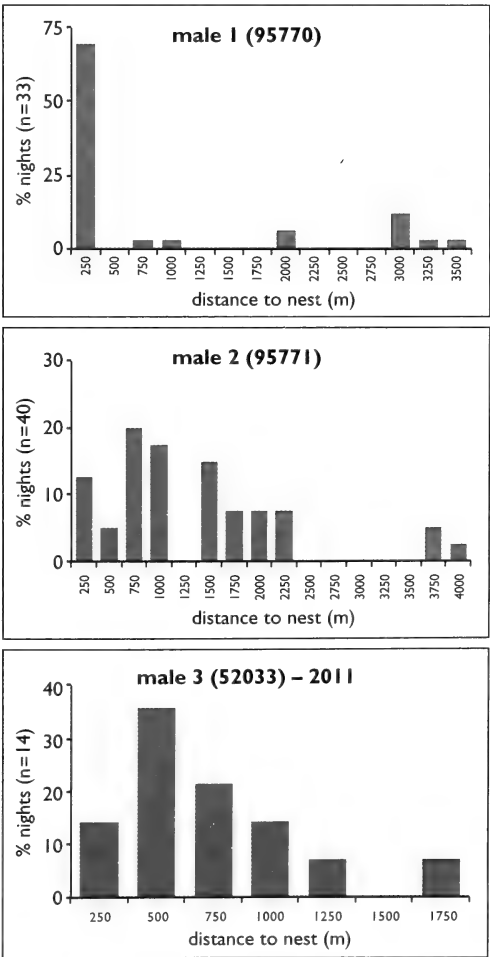


Fig. 8. Distance of overnight fixes from the nest, for males 1, 2 and 3.

morning than later in the day. Thereafter, activity remains more or less constant through the day, but can tail off towards evening; the start and end of activity is determined primarily by whether there is enough light to navigate by. Other wasp species appear to have a similar activity pattern, but hornets are active at night as well as by night (Spradbery 1973; Matsuura & Yamane 1990; Archer 2005, 2012). It remains unclear why Honey-buzzards tend to curtail their activities earlier in the day than some of their key prey species.

Discussion
Size of the home ranges

The home range (KDE 95%) of three of the four males varied between 13.5 and 17.3 km²,

while male 2 had a markedly larger home range, of 25.8 km². Male 2 foraged in woodlands to the west and north of its nest, which are known to regularly support breeding Honey-buzzards, although we do not know whether these territories were occupied in the study year. Home ranges of males can

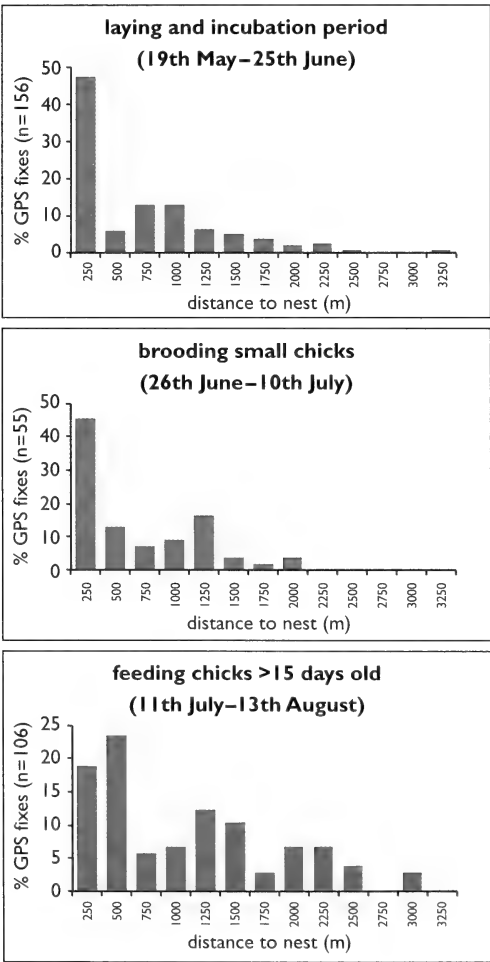


Fig. 9. The spatial distribution of daily fixes of male 3 (52033) in 2011, plotted in relation to the nest site, during three different phases of the breeding cycle.

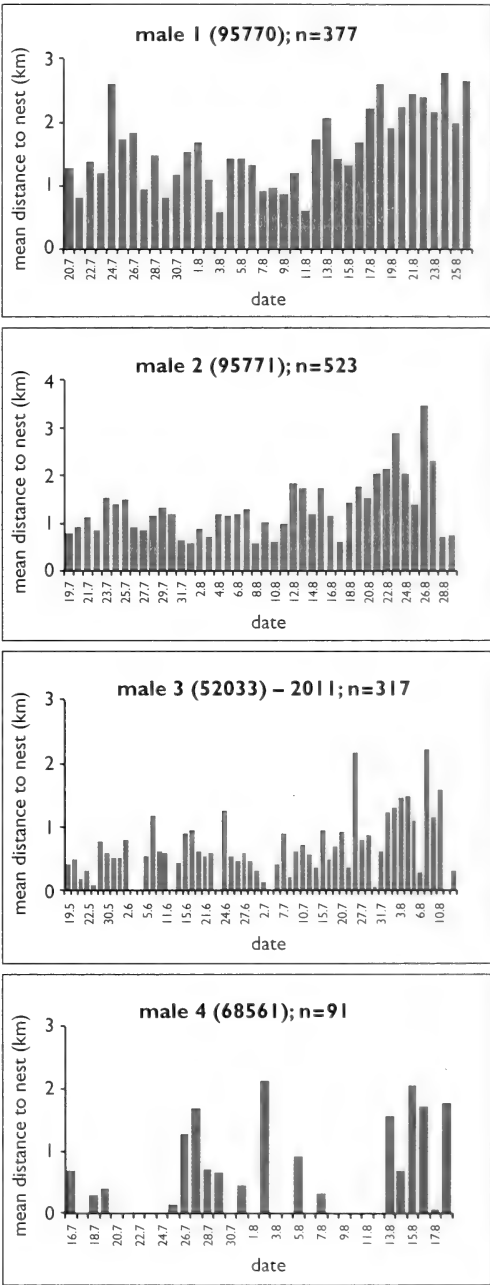


Fig. 10. Mean distance from the nest of fixes during each day as the breeding season progresses (all fixes plotted, from 30 minutes before sunrise to 30 minutes after sunset).

overlap (van Manen *et al.* 2011; pers. obs.), but the frequency with which male 2 visited these woods may indicate that neighbouring territories were not occupied in 2009 and that, compared with the other males, this individual was able to make use of a larger area than usual without encountering other breeding birds.

The 15 males studied by van Manen *et al.* (2011) in the Veluwe area of the Netherlands had home ranges (KDE 95%) of 5.7–13.1 km² with a mean of 9.6 km², thus smaller than those in Schleswig-Holstein. The proportion of woodland in the Veluwe area is, at 49%, considerably greater than the 15–20% woodland cover in the Schleswig-Holstein study area. Since wasp nests are found primarily in woodland, it is likely that the Veluwe Honey-buzzards were able to find sufficient food within a smaller area than in Schleswig-Holstein. The density of wasp nests is known to be one of the factors affecting the size of the home range (Gamauf 1999).

A greater proportion of woodland does not automatically result in a smaller home range, however. The home ranges of six male Honey-buzzards in the southern part of the Netherlands, where the study areas had 28–33% woodland cover, were 13.8–45 km² (MCP 95%) during the second half of the nestling period, larger than in Schleswig-Holstein during the equivalent period (6.3–17.4 km²; van Diermen *et al.* 2013). The authors noted a declining attachment to woodland of four of the six males through this period, and found that traps set out in August to determine wasp density caught more wasps outside than within woodland. The large home ranges in this well-wooded study area may reflect the depletion of wasp nests within woodland during the year.

Diet

After their arrival in the breeding area, Honey-buzzards initially feed mainly on amphibians, young birds and (less frequently) reptiles. As colonies of social wasp species develop, Honey-buzzards switch to wasp larvae as their staple diet (Holstein 1944; Itämiä & Mikkola 1972; van Manen *et al.* 2011).

Social wasps (Vespidae) pursue one of two life strategies. In the first, they develop small colonies with a lifespan of 3–4 months, in nests that are free-hanging in vegetation or built close to the surface of the soil, and which benefit from direct warmth from the sun. The Red Wasp *Vespula rufa* and the long-faced wasps *Dolichovespula* spp. pursue this strategy. The alternative strategy, followed by the German Wasp *V. germanica* and the Common Wasp (Archer 2012), is to develop large colonies that can live for 5–6 months in underground nests, where they are insulated against cool weather in autumn. Although all wasp species begin to develop their colonies at about the same time, in mid May, those using the first strategy can complete their colony-building as early as July, weeks before the latter reach their peak development. The timing of the German and Common Wasp colonies fits in better with the food requirements of young Honey-



265. An excavated wasp nest in deciduous woodland in the study area; July 2011. This shows the characteristic remains of a wasp nest that has been exploited by a Honey-buzzard *Pernis apivorus*, with empty but intact comb fragments – Honey-buzzards eat the individual grubs, whereas mammals would chew the comb.

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266. Adult male Honey-buzzard *Pernis apivorus* carrying wasp comb; Germany, August 2014.

buzzards. As the colonies of these species also contain more larvae than any of the other species, they tend to dominate the diet of older chicks. Hornets *Vespa crabro* also pursue the second life strategy. However, since their nests are mostly built in tree holes, they are less accessible to Honey-buzzards, unless built in rotting soft wood (van Diermen *et al.* 2013; Harmsen & Bijlsma 2014).

Based on satellite fixes, 33 Common Wasp, two German Wasp and two bumblebee nests were located and recorded as Honey-buzzard prey in this study. In 1993–95, Ziesemer (1997) recorded more varied prey of four male Honey-buzzards, which included 43 Common Wasp, nine German Wasp and 13 nests of four other wasp and bumblebee species. This predominance of the two wasp species with the largest colonies (especially Common Wasp) is probably due not only to the fact that their nests offer more food, but also to the research method used. The probability of observers locating food remains increases with the conspicuousness of the remains left behind. The exploitation of a small hanging wasps' nest in a bush leaves few visible remains, while large wasps' nests excavated from the soil are most likely to be found by human observers. Since, in our study, the Honey-buzzards were not fitted with transmitters until July/August, the

chance of establishing *Dolichovespula* species and *V. rufa* as prey species was reduced. In addition, the timing of transmitter broadcasts (one fix every hour, at best), meant that the likelihood of observers finding a nest was greater if a Honey-buzzard had been occupied with it for a number of hours. With less than one fix per hour, as was often the case, the probability of finding any food remains at all was greatly reduced. Yet although the technology did not permit a representative interpretation of prey choice, it did show that the Honey-buzzards located large wasps' nests, the main source of food for rearing their young, above all in woodland (78%) and in the edge habitats of the agricultural landscape.

It is not clear why the German Wasp is so under-represented as prey compared with the Common Wasp. Both species occur widely in Europe where, according to Gusenleitner (1975), Common prefers cooler regions than German. Both species are generally common in Schleswig-Holstein, though they differ in their habitat requirements. Common occurs both in woodland and elsewhere, whereas the German Wasp tends to avoid woodland (Dvořák 2007). Honey-buzzards will seek and locate wasp nests both within and outside woodland, however, so differences in habitat preferences of the two wasp species are not necessarily the reason for the marked

variation in their occurrence in the prey list. A noticeable decline in the population of German Wasps was reported in England in the period 1970–2000 (Archer 2001), and is also suspected to have occurred in Germany (Witt 2010).

As well as a possible population decline, a change in the seasonal occurrence of the German Wasp is a potential reason for its under-representation in prey. Tryjanowski *et al.* (2010) and Visser & Both (2005) point to the fact that some wasp species, including German Wasp, have markedly advanced their flight times in association with climate warming. Bijlsma (2012a) established that, for several years now, German Wasps had reached the peak of their activity as early as mid July, and that nests could be largely abandoned by the beginning of August. The reduction in availability of such an important prey item, especially at the time of greatest demand for food, could affect Honey-buzzard breeding success, and further study would be worthwhile.

The density of all wasps' nests combined – and therefore the Honey-buzzard's main food supply – is subject to strong fluctuation. According to a frequently cited example from England (the Royal Horticultural Society gardens at Wisley, in Surrey, 1921–1949), this can vary by a factor of about 42 (Archer 2012). Bijlsma (2012b) found a similar range of fluctuation (factor of 40) in the Netherlands during the period 1974–2011. To date, however, only wasp availability in extreme years has had a noticeable effect on the breeding success of Honey-buzzards. Seemingly, in years when wasps are scarce, sufficient alternative prey, such as frogs and young birds, was available.

Distance from the nest

It is not possible to determine the fine detail of the tagged birds' movements in

this study because of the interval between fixes (one hour or longer). Although males search for food in all parts of their home range, they tend to actively defend their territory within a radius of 2 km of the nest (Gamauf 1988; Ziesemer 1997). In good weather conditions, they can spend a great deal of time in the air. Flights to more distant locations are primarily foraging trips, and we attributed all fixes within a radius of 80 m of the nest to the immediate care of the brood (nest-building, breeding, feeding, on watch, etc.).

In Honey-buzzards, both sexes contribute to incubation and brooding. There are, however, differences in the division of tasks between the partners (e.g. Holstein 1944, Roberts & Law 2014). The proportion of fixes within 80 m of the nest recorded for male 3 in 2011 was 40% during egg-laying and incubation, 42% when the nestlings were small, but just 23% when the nestlings were large enough to be left unattended. This corresponds fairly well to the values recorded for several males in the Netherlands by van Manen *et al.* (2011): around 40% until the young hatched, 30–40% in the period when small nestlings had to be kept warm and about 10% subsequently.

The distances that males travelled away from the nest were also similar in both studies. In this study, 99% of all fixes were within a radius of 4 km of the nest, whereas the equivalent figure in van Manen's study



267. Male and female Honey-buzzards *Pernis apivorus* at the nest site, with small chick; the male bird (left) has arrived with a piece of wasp comb; Germany, 13th July 2014.

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was 94%. During the course of the breeding season, the Dutch males extended their search for food from 1.5 to 3 km from the nest, on average. This corresponds with flights of increasing distance in Schleswig-Holstein (figs. 9 & 10), although it is not possible to attribute these to particular activities. In the same way, van Manen *et al.* (2011) found that most of the males roosted at night at different locations, on some occasions at wasp nests that had not yet been exploited. Such 'guarding' of exposed wasp nests reflects the fact that they are otherwise easily exploited by other Honey-buzzards (Ziesemer 1997; van Diermen pers. comm.).

In the Netherlands, it was found that females regularly foraged more than 10 km from the nest (van Manen *et al.* 2011), whereas males remained closer to the nest site, as in our study. During these longer flights, females specifically visited individual, food-rich locations. Therefore, their home range could be regarded as several, widely separated areas that, taken together (based on KDE 95% for foraging positions), could be even smaller than the home range of the males. Similar flights have also been recorded in Schleswig-Holstein; for example, one female traversed several other Honey-buzzard territories, about 1–2 days before the first chick hatched (Ziesemer 1997). This is unusually early, as in most years females will undertake long foraging flights only once the chicks are old enough to maintain their body temperature unaided (van Diermen pers. comm.). Later, when the chicks are well grown (four weeks or more), females frequently visit distant foraging areas, as far away as 124 km from the nest and for one or several days, before subsequently returning, sometimes to feed their young (van Diermen *et al.* 2013).

Habitat

The fixes of all four males in our study showed a clear preference for woodland, even after taking into account the fact that nests are situated within this habitat. This, we believe, relates to the biology of social wasps and bumblebees, which build their nests underground as well as in trees and bushes. Ground nests, which are frequently built in abandoned mouse holes, can be constructed

only in unbroken soil. Thus arable land, which is tilled annually, is usually avoided, while grassland is suitable only to a limited extent, owing to the trampling of livestock and disturbance of the soil by heavy machinery. Wasp nests in human settlements can be exploited only if there is little human disturbance, for example in the large gardens on the outskirts of small settlements (Ziesemer 1997; van Manen *et al.* 2011). Wasps' nests are therefore predominantly accessible to Honey-buzzards in woodland, as well as around the margins of the agricultural land, particularly in banked hedgerows but also verges and embankments, etc. The significance of woodland was also demonstrated in this study by the fact that 78% of the exploited wasp and bumblebee nests we found were in this habitat.

Acknowledgments

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Fridtjof Ziesemer completed a PhD on the Northern Goshawk, worked as a conservationist and has studied the Honey-buzzard for more than 20 years. Bernd-Ulrich Meyburg has carried out research on no fewer than 16 raptor species and marked several hundred birds of prey using satellite tags.

Bird Photograph of the Year 2015

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Now in its 39th year, the *BB* Bird Photograph of the Year competition remains the premier competition that documents unusual or rarely photographed bird behaviour. Since its inception, the competition has sought to highlight photographs that ‘tell a story’ about the birds concerned, rather than just reward attractive portraiture, but the award has also provided a showcase for novel photographic techniques employed to achieve unusual effects. Although the rules allow photographs of regularly occurring Western Palearctic species taken anywhere in the world, most of the entries received, and the majority of those in the final shortlist, were of birds photographed in Europe, and the UK in particular.

As the popularity of bird photography has grown, so have the photographers’ skills and the quality of their results. Many of the people entering their work use top-of-the-range camera bodies and lenses, and the overall quality of the competition reflects this trend. At the same time, the costs of administering the award have also increased over the years. Without the support of a series of loyal sponsors, stretching all the way back to the first award, in 1977, we would have been unable to offer the sort of prizes that help to make the competition what it is today.

We are immensely grateful to Anglian Water (www.anglianwater.co.uk) for continuing as our principal sponsor in 2015. This relationship between *BB* and Rutland Water – where the British Birdwatching Fair is hosted – has been a long and fruitful one. Many readers will have viewed the winning photographs on the *BB* stand at the Birdfair, where the awards have been presented for many years now, and met the photographers after the awards ceremony. In addition, our loyal supporters of many years, Christopher Helm/Bloomsbury (www.bloomsbury.com) and Collins (www.harpercollins.co.uk), have maintained their support, while the Eric Hosking Charitable Trust (www.erichoskingtrust.com) continues to encourage digitising as a medium for documenting birds and bird behaviour. Last but not least, we thank Simon King (www.simonkingwildlife.com) for once again giving his time to present our awards and for contributing to this account. We thank all our sponsors – without them *BB* would not be able to host this competition – and look forward to working together again.

The prizes for the winners will be presented at this year’s British Birdwatching Fair on Friday 21st August. The top images will be on show at our stand (marquee 3, stands

24/25) and, as in 2014, you will be able to cast your vote to decide the public's favourite image. When we have done this in previous years, the outcome has been quite different from the judges' decision – let's see whether you agree with us this year! Entry details for the next competition have yet to be finalised, but will be available in the January 2016 issue of *BB* and on our website: www.britishbirds.co.uk

The winning entries

From the hundreds of entries for this year's competition, it would have been expected that each judge would have their particular favourite. So for three judges to place Tom Dyring's Grey Heron *Ardea cinerea* in the top slot is almost without precedent. Tom captured his winning image at Lake Csaj in Hungary on a January evening during a heavy rainstorm (plate 268). Clearly much thought went into this photograph: the combination of composition and lighting creates a most unusual image. It could be argued that the use of artificial lighting is creating a

scene that does not truly reflect the 'nature' of the image, yet the heron is behaving in an entirely natural way: it is the photographer's imagination, knowledge of bird behaviour and photographic skills that have combined to capture this result. To produce this image, Tom placed a cold-light lamp behind the bird to create a backlight, while at the same time placing a warmer light in front of the bird to add a warmer glow to the picture. This imaginative use of light is further enhanced by using a slow (1/20 second) exposure, while still underexposing the image by two full stops. The combined effect of the prolonged exposure and creative lighting has captured the scene in a way that the judges had not encountered before. Tom's image thus becomes the overall winner of the 39th *British Birds* Bird Photograph of the Year award.

In second place comes the touching, yet dramatic scene of a female Goosander *Mergus merganser* and her brood of youngsters, negotiating the swirling waters of the River Wye near Bakewell in Derbyshire. This

1st	Grey Heron <i>Ardea cinerea</i>	plate 268	Tom Dyring
2nd	Goosander <i>Mergus merganser</i>	plate 269	Gary Smith
3rd	Gadwall <i>Anas strepera</i>	plate 270	Graham Catley
4th	Grasshopper Warbler <i>Locustella naevia</i>	plate 271	John Robinson
5th	Dipper <i>Cinclus cinclus</i>	plate 272	Helen Brassington
6th	Hen Harriers <i>Circus cyaneus</i>	plate 273	Robert Snell
7th	Black-winged Stilts <i>Himantopus himantopus</i>	plate 274	Michele Mendi
8th=	Common Goldeneyes <i>Bucephala clangula</i>	plate 275	Jonathan Gaunt
8th=	Great Crested Grebe <i>Podiceps cristatus</i>	plate 276	Austin Thomas
10th	Greenshanks <i>Tringa nebularia</i>	plate 277	Ray Tipper
11th	Night Heron <i>Nycticorax nycticorax</i>	plate 278	Ian Butler
12th=	Red Kite <i>Milvus milvus</i> and Marsh Harrier <i>Circus aeruginosus</i>		Michele Mendi
12th=	Wren <i>Troglodytes troglodytes</i>		Edmund Fellowes
14th	Little Bustard <i>Tetrax tetrax</i>		Peter Beesley
15th	Hoopoe <i>Upupa epops</i>		Ashley Grove
16th	Great Grey Owl <i>Strix nebulosa</i>		Markus Varesvuo
17th	Little Owl <i>Athene noctua</i>		Austin Thomas
18th	Willow Grouse <i>Lagopus lagopus</i>		Markus Varesvuo
19th	Red-backed Shrike <i>Lanius collurio</i>		Philip Ward
20th	Short-eared Owl <i>Asio flammeus</i>		Marcus Conway
Digiscoped entries			
1st	Isabelline Wheatear <i>Oenanthe isabellina</i>	plate 279	Ian Boustead
2nd	Oystercatcher <i>Haematopus ostralegus</i>	plate 280	John Davis
3rd	Woodcock <i>Scolopax rusticola</i>		Mark Dillingham

image is full of action and drama, and tells the story without the need for narrative (plate 269). This particular female remained loyal to a small section of the river for a couple of days, which provided Gary Smith with the opportunity to return to photograph the family. After spending some time observing the female marshalling her brood, he watched the scene unfold as she decided to take the ducklings upstream. This particular image shows one of her many attempts to negotiate a small weir with all four youngsters; and she eventually succeeded, much to Gary's delight. The experience was so engrossing that photography became almost an afterthought. But with second place we can assume that Gary is quietly pleased that he recorded such a memorable event.

Graham Catley is no stranger to this competition, and this year he returns with an outstanding image of a drake Gadwall *Anas strepera* taking flight at Waters Edge Country Park, near Barton-upon-Humber, in north Lincolnshire, which earns him third place (plate 270). On a beautifully sunny January morning the Gadwalls were feeding on the flat-calm pond alongside Common Coots *Fulica atra*, which would occasionally chase the ducks and put them to flight. By concentrating on a drake Gadwall that looked to be a likely recipient of this pent-up Coot aggression, Graham framed the duck in the viewfinder and began shooting as it showed the first signs of taking off. From this series of shots he managed two that captured the action. This image was by far the best of the sequence, revealing the power of the bird's wingbeats on take-off and also the intricate colours of its subtle plumage.

John Robinson captured the lucky moment when a Grasshopper Warbler *Locustella naevia* appeared and began sun-bathing close to the hide at Chelmarsh Reservoir, Shropshire, which he was using to

photograph Sedge Warblers *Acrocephalus schoenobaenus* (plate 271). As he watched, the bird seemed to go into a trance and remained in this contorted position for about ten minutes; perhaps it had nodded off? This gave John ample time to cut a hole in the side of the canvas hide he was using and capture this interesting behaviour. Had it not been for the rather distracting bright green foliage in the background, this image might well have been ranked even higher than fourth place. We would be interested to know whether readers can suggest an explanation for this curious behaviour.

Fifth place goes to Helen Brassington's endearing portrait of a juvenile Dipper *Cinclus cinclus* sheltering from the rain under a large leaf (plate 272). Knowing where a pair was nesting, Helen had planned to photograph them but on arrival was surprised to see two adult Dippers frantically going back and forth from under a waterfall. Thinking they must have large young in the nest, she set up her tripod and settled down to watch. Five hours later, and much to her surprise, four young Dippers fledged from an unseen nest behind the waterfall, just as heavy rain started. In a captivating moment, one of the young Dippers landed on a stone right in front of her and used a large leaf as an umbrella to shelter from the rain. Clearly it didn't yet realise that it was destined to spend all of its life dipping in and out of the water!

In recent years Hen Harriers *Circus cyaneus* have been in the headlines for all the wrong reasons. As a consequence of illegal persecution, they are all but extinct as breeding birds in England. Robert Snell was fortunate to come across a nesting pair on Islay and, after obtaining the required Schedule 1 licence from Scottish Natural Heritage to visit the nest, he set up a hide from which he was able to capture a series of images of these beautiful raptors. Of his three

Simon King commented on the winning photo: 'This image is a magnificent marriage of photographic know-how with a sound understanding of natural history. The use of artificial light to realise a predetermined vision is exceptional and clearly had no negative impact on the subject in this case. So much consideration has gone into the realisation of this image, including the lighting – both behind and in front of the heron – and the focal length of lens and aperture, creating a very thin depth of field to focus the viewer's attention on the bird. Add to this the slow shutter speed, allowing the back-lit raindrops to paint a silver-striped curtain across the scene, and you have the makings of a winning photograph.' For more information about the Simon King Wildlife Project, please visit www.simonkingwildlife.com



268. Bird Photograph of the Year 2015 Grey Heron *Ardea cinerea*, Lake Csaj, Hungary, January 2015. (Nikon D4, Nikkor 200–400 mm f4 @ 240 mm; 1/20, f4, ISO 3200.) Tom Dyring



269. Second Goosander *Mergus merganser* with ducklings, Derbyshire, May 2014. (Nikon D7100, Nikon 300 mm f2.8 AFS; 1/2000, f5, ISO 1250.) Gary Smith



270. Third Gadwall *Anas strepera*, Waters Edge CP, Barton-upon-Humber, Lincolnshire, January 2014. (Canon EOS 1D Mk IV, Canon 500 mm f4; 1/2500, f5, ISO 500.) *Graham Catley*

entries, the judges were particularly impressed with this food exchange between male and female (plate 273). The male Hen Harrier rarely visits the nest but regularly brings food to the female, which he calls from the nest, and in response she catches the prey as the male releases it. On this occasion the food pass occurred close to the nest and Robert was able to photograph the prey (clearly not a grouse chick) in mid-air. You can almost sense the concentration of both birds as the male looks down on the released prey, ready for the female, her eyes acutely focused, to catch it in her talons.

In recent years Michele Mendi has entered several outstanding images in this competi-

tion from his native Italy. This year is no exception and two of Michele's entries have made the top 20. In seventh place is a nicely composed group of Black-winged Stilts *Himantopus himantopus* taken just after sunrise on an April morning at the Torrile and Trecasali LIPU Natural Reserve, near Parma, in northern Italy (plate 274). Michele wanted to capture the stilts against the attractive backdrop of trees reflected in the water, and an early morning visit was essential to achieve this effect. These four birds seemed intent on consummating their breeding nuptials, and the combination of the 'dancing' stilts and the vivid backdrop makes a striking composition.



John Robinson

271. Fourth Grasshopper Warbler *Locustella naevia*, Chelmarsh Reservoir, Shropshire, May 2014. (Nikon D7100, Nikkor 70–300 mm @ 220 mm; 1/160, f9, ISO 640.)



Helen Brassington

272. Fifth Dipper *Cinclus cinclus*, Derbyshire, April 2014. (Nikon D7100, Sigma 150–500 mm f5.6–6.3 @ 450 mm; 1/320, f6.3, ISO 800.)



Robert Snell

273. Sixth Hen Harrier *Circus cyaneus*, Islay, Argyll, June 2014. (Canon EOS 5D Mk III, Canon 300 mm f2.8 + 1.4x converter; 1/8000, f6.3, ISO 800.)

Michele Mendi



274. Seventh Black-winged Stilts *Himantopus himantopus*, Torrile and Trecasali LIPU Natural Reserve, Parma, Italy, April 2014. (Canon EOS 1D Mk IV, Canon 500 mm f4 + 1.4x converter; 1/500, f6.3, ISO 500.)

Jonathan Gaunt



275. Eighth= Common Goldeneyes *Bucephala clangula*, Northumberland, March 2015. (Canon EOS 1DX, Canon 500 mm f4 + 1.4x converter; 1/1250, f8, ISO 800.)

The Common Goldeneye *Bucephala clangula* is a strikingly beautiful duck that rarely grabs the headlines, but in early spring the males perform their 'head throwing' display in the hope of attracting a mate. In this scene, captured by Jonathan Gaunt on a Northumberland lake and placed in equal eighth position, the female appears to show little interest in the efforts of the two displaying males (plate 275). By getting low to the water and using a bean bag to support the lens, Jonathan has captured a shot from a Goldeneye's 'eye-level' perspective – it almost feels like you are there among them.

Another eye-level shot, this time of a Great Crested Grebe *Podiceps cristatus* supporting its chick, was also ranked equal eighth. Austin Thomas had monitored this pair of grebes for several weeks, carefully noting their progress from egg-laying to hatching, and building trust to ensure that the grebes were comfortable with his presence. But he had to wait until the subtle light of a May evening created the ideal conditions to produce the image he wanted (plate 276). To achieve this image, he mounted the camera onto a custom plate that enabled it to be operated just above the water's surface,

and the image was deliberately underexposed to darken the background and preserve the details in the whites of the bird.

Tenth place goes to Ray Tipper's action-packed shot of a group of Greenshanks *Tringa nebularia* chasing fish fry on the Deep Bay mudflats in Hong Kong (plate 277). Being a regular visitor to Hong Kong, Ray understands its birds well, so he waited for the numerous herons, gulls and waders to be pushed towards the hide on the rising tide. Almost imperceptibly, this group of Greenshanks came together and what followed was a compelling display of cooperative feeding. As one, the group stretched their necks forward and lowered their open bills into the water as they ran forward quickly for a few seconds, only to repeat the performance time and again so that they had soon travelled 100 m or more. They then turned around and continued feeding in this manner, quickly arriving back to where they started and continuing beyond. The synchronised actions of the group were fascinating to watch; although this behaviour appears not to have been documented previously for Common Greenshanks, Spotted Redshanks *T. erythropus* are not uncommonly seen behaving similarly.



Austin Thomas

276. Eighth= Great Crested Grebe *Podiceps cristatus*, Lancashire & North Merseyside, May 2014. (Canon EOS 1DX, Canon 800 mm f5.6; 1/1600, f8, ISO 800.)



277. Tenth Greenshank *Tringa nebularia*, Deep Bay, Mai Po Nature Reserve, Hong Kong, February 2014. (Nikon D300, Nikkor 500 mm f4 G ED VR + Nikon TC14E II 1.4x converter; 1/1600, f5.6, ISO 200.)

In eleventh place is Ian Butler's photograph of a juvenile Night Heron *Nycticorax nycticorax* at Pusztaszer in Hungary as the sun was setting (plate 278). Taking advantage of the fish that were trying to remain concealed in the shadow of the hide, it approached to within 4 m and remained completely motionless before striking. Since it was so close, it proved impossible to get the entire bird into the frame, so this imaginative crop reveals the Night Heron's concentration, clearly apparent in its intense stare, while the reflected warm yellow glow of a distant reedbed complemented the image.

In equal twelfth position comes Michele Mendi's second top-20 entry. While photographing Common Cranes *Grus grus* in Spain, he was distracted by this interaction between a Red Kite *Milvus milvus* and a Marsh Harrier *Circus aeruginosus*. Here we can see the kite defending itself from the unwarranted attention of the harrier, a fine example of a common, yet rarely photographed behaviour. Michele was lucky to be in the right place at the right time, and of the many images he took of this aerial clash, this one captured the moment perfectly.

Also ranked equal twelfth is a super shot of a Wren *Troglodytes troglodytes* from last year's overall winner, Edmund Fellowes, who had prepared a dust bath for House Sparrows *Passer domesticus* in his garden in Dumfries & Galloway. In dry weather many birds take a dust bath to help with feather maintenance and keep parasites at bay. In this image, Edmund has perfectly captured this behaviour, even freezing the dust particles which the Wren is flicking above its back.

Digiscoping

From the entries received, it seems clear that Swarovski is becoming the telescope of choice among digiscopers, and this brand was used by all of this year's top three. Camera choice, however, remains less predictable, and with new models appearing on the market almost every month there is a high turnover in camera choice as digiscopers strive to obtain the best scope and camera combination. The popularity of 'phonescoping' for record shots has also increased dramatically in recent years, as the quality of the camera in many smartphones



Ian Butler

278. Eleventh Night Heron *Nycticorax nycticorax*, Pusztaszer, Hungary, June 2014. (Canon EOS 5D Mk III, Canon 500 mm f4 + Canon 25 mm extension tube; 1/640, f7.1, ISO 2000.)



Ian Boustead

279. Digiscoping winner Isabelline Wheatear *Oenanthe isabellina*, Cleveland, November 2014 (Nikon 1 V1, 18.5 mm prime, Swarovski ATX95 telescope; 1/250, f4.5, ISO 400.)

Simon King commented: 'The magic of digiscoping rare or elusive birds is brought to the fore here with this crisp image of a rare traveller. The subtleties of the wheatear's plumage are perfectly offset against the neutral beach background and the distance of the bird from the observer presents a pleasing low-angle effect, getting you alongside the subject.'

John Davis



280. Digiscoping runner-up Oystercatcher *Haematopus ostralegus*, Ceredigion, November 2014 (Panasonic Lumix TZ35, Swarovski 80 HD telescope with a 20x60 zoom eyepiece; 1/500, f3.9, ISO 100.)

has increased, and the convenience of phonescoping is hard to beat

The winner of the Eric Hosking Charitable Trust award for 2015 is Ian Boustead's digiscoped image of an obliging Isabelline Wheatear *Oenanthe isabellina* that appeared on the north side of the River Tees near North Gare, Cleveland, in November 2014. This bird was a photographer's dream, working its way along the high tide line, completely oblivious to the crowd of attendant admirers (plate 279). It proved to be an ideal subject for digiscoping, with the plain

background enabling the camera to focus just on the bird. Of the many images that Ian took, this winning image captured the subtle plumage and structural characters of a species which can sometimes be hard to identify. This is a good example of what the judges look for in the digiscoping section: documenting a rarity or capturing behaviour of ornithological interest that might otherwise go unreported.

In second place comes an image of a leucistic Oystercatcher *Haematopus ostralegus* taken by John Davis in Ceredigion. This striking individual has frequented the rocky and pebbly coast in the Llanon–Llansantffraed area since January 2006, although it disap-

pears during the breeding season. Although it is a distinctive bird, it is often quite distant and associates with other Oystercatchers, making a close approach difficult. On this occasion, however, it was feeding fairly close to the low clifftop path at Llanon, and John made the most of the opportunity presented to record its interesting plumage (plate 280).

Acknowledgments

Our thanks go to the BTO for allowing us to use the Nunnery in Thetford to view the entries, and especially to Dawn Balmer for providing refreshments.

Richard Chandler, Tim Appleton, Robin Chittenden, David Hosking, Peter Kennerley, Simon King and David Tipling, c/o 4 Kings Road, Oundle, Peterborough PE8 4AX

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Reviews

Undiscovered Owls: a Sound Approach guide

Magnus Robb and The Sound Approach

The Sound Approach, Dorset, 2015

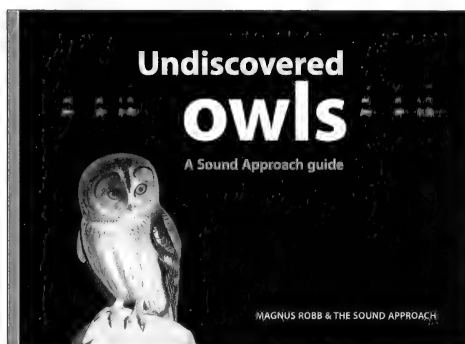
Hbk, 308pp; many colour illustrations
and figures, four CDs

ISBN 978-90-810933-7-8, £39.95

This book documents the vocalisations of all owl species in the Western Palearctic, with thorough coverage of the generally recognised subspecies. Following the established 'Sound Approach' formula, the reader is guided through four CDs of hoots, screeches, growls and chatters with behavioural notes (both for the birds and for the sound recordists), explanatory text and annotated sonograms.

A central premise of the book is that the vocalisations of owls are hardwired – genetically innate, not learnt – without the cultural transmission that is the case for most passerine species. Hence if two taxa of owl have different vocalisations, this is symptomatic of underlying genetic divergence and implies a long period of isolation without interbreeding. This is a very solid and defensible line of argument, and is taken to its logical extreme in this book. *Undiscovered Owls* presents the reader with numerous treatments of 'new' or resurrected species promoted from subspecies on the basis of vocalisations and/or plumage, with new and largely unfamiliar vernacular names. These include: the so-called 'Slender-billed Barn Owl' *Tyto (alba) gracilirostris* of the eastern Canary Islands, 'Cape Verde Barn Owl' *T. (a.) detorta* and 'Madeira Barn Owl' *T. (a.) schmitzi*; a split of western European Little Owls *Athene (noctua) vidalii* from the bizarrely named 'Cucumiau' (other Little Owl taxa); 'Cyprus Scops Owl' *Otus (scops) cyprius* (split from Eurasian Scops Owl) and 'Arabian Scops Owl' *O. (senegalensis) pamela* (split from African Scops Owl); 'Arabian Eagle Owl' *Bubo (africanus) milesi* and 'Turkish Fish Owl' *B. (zeylonensis) semenowi*; 'Lapland Owl' *Strix (nebulosa) lapponica* (split from North American Great Grey Owl) and 'Maghreb Wood Owl' *S. (aluco) mauritanica* (re-split from Tawny Owl after many years in the systematic wilderness).

In many cases the genetic evidence of potential splits has already been published, and the Sound Approach vocalisation data cement the evidence



for a taxonomic rethink. These 'undiscovered' owls are a primary reason why most serious Western Palearctic birders are going to want to get this book. Not everyone will accept the evidence for new splits uncritically – vocal or plumage differentiation alone may not satisfy biological species criteria without evidence that it acts as a species-defining signal that prevents interbreeding between the different taxa under consideration. The evidence presented remains indicative of potential splits, but many of the biological situations remain in flux or under-studied. For example, the authors' summary of the genetic data supporting a split of western European Little Owls from the 'Cucumiau' significantly underplays the subtlety of the genetic data as provided in the original paper. Of course, the authors make no claim that their arguments should be accepted uncritically, but it is something the reader needs to bear in mind.

In spite of the relaxed text and extraneous anecdotal material, this is a scientific book, and science has methods and protocols that are not there just to make life difficult. The clash between urgency to disseminate data and formal scientific protocol has become apparent in the naming of what, quite rightly, might be regarded as a crowning achievement of The Sound Approach team, the 'accidental' discovery of the Omani Owl. 'Accidental' is perhaps unnecessarily harsh: fortune does after all favour the prepared mind, and nothing is discovered unless the right team with the right knowledge is doing the right thing in the right place at the right time, none of which is really accidental. Nevertheless, this previously unsuspected resident of Oman was recorded incidentally during a recording session for Pallid Scops Owl *Otus brucei*, and it is to the credit of the



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finders that they realised this must be something very special, leading to the formal description of 'Omani Owl *Strix omanensis*' in *Dutch Birding* on the basis of photographs and sound recordings, but without any physical (i.e. a specimen) or molecular (DNA) evidence (Robb *et al.*, 2013; *Dutch Birding* 35: 275–310). Such a move was always likely to lead to scrutiny in formal scientific circles and, as it turns out, with good reason. Re-examination of the bedraggled type specimen of Hume's Owl *S. butleri* (Kirwan *et al.*, 2015; *Zootaxa* 3904: 28–50) showed that it is not the same as subsequent specimens or the species that has in modern times been known as Hume's Owl. The type specimen of Hume's Owl may be an Omani Owl, but because there is no physical voucher material for Omani Owl, this cannot currently be fully confirmed or refuted. This leaves us with what we used to call Hume's Owl now redesignated as 'Desert Tawny Owl' *S. hadorami*, with

the Omani Owl in nomenclatural limbo.

The volume and depth of information in this book, with its accompanying CDs, is overwhelming, in a good way, and it acts as an essential and thought-provoking reference work. It is also a very entertaining read. The Sound Approach team is not exactly crippled by self-doubt, and I could live with a little less text about people and circumstances, when perhaps the quality of the ornithology should be allowed to speak for itself. Nevertheless, gems of information such as 'Short-eared Owls *Asio flammeus* are complete bastards to record' pretty much set this book apart from similarly authoritative works. The Sound Approach series of books stands alone and unique in format in the contemporary world of bird books, and this contribution represents an outstanding addition to the stable.

Martin Collinson

Birding in Poland

Edited by Adam Sterno

Oriolus Publishing House, 2015

Hbk, 590pp; 40 colour photographs, 164 maps

ISBN 978-91-978652-1-0, £34.99

Poland is perhaps bigger than most people imagine – it is a third larger than the UK and heavily forested – almost 30% of the land is woodland – while there are about 10,000 waterbodies covering more than a hectare each. And, in a recent survey of travelling British birdwatchers, Poland emerged as the fifth most-visited European country, so it comes as a surprise that until now there has not been a book outlining in detail the many sites that you can visit. Most visiting birders have tended to focus on the prime areas of the Biebrza Marshes and Białowieża Forest. These are the two sites that provide easy access to the target birds that many of us want to see. But this book provides a much wider approach, with 119 sites in total.

A team of 46 people worked to create this book, which is split into 14 chapters (often, but not always, covering the main provinces of Poland). Each of the sites is described in detail, and for some there are GPS references to enable quick identification of access points and major features. Key species are listed within a very readable text – which often runs to over 1,000 words –

with subsections by habitat or season. Other animals and interesting plants are also mentioned in a separate section.

There is plenty of detail on access possibilities, a description on how to reach the site, and links to useful websites and published articles. Each site is accompanied by at least one map.

A checklist of 449 species gives the status of each, while a further 62 species of uncertain origin are listed separately. An alphabetical species index allows you to search for sites where these can be seen. There is an overall map of the country showing every site within the book, but maps showing the 14 chosen regions in more detail would have been useful.

With flights now operating from the UK to 11 widely spaced Polish airports, there has never been an easier time to explore this exciting country. This book will be a great asset to visiting birders.

Keith Betton



Recent reports

Compiled by Barry Nightingale and Harry Hussey

This summary of unchecked reports covers early June to early July 2015.

Headlines June was a month packed with summer surprises, with rarities arriving from almost every direction. Highlights of an exceptional period included a Cretzschmar's Bunting in Caernarfonshire, an Eleanora's Falcon in Scilly, Cedar Waxwings in Argyll, Co. Clare, Pembrokeshire and Scilly, a Hudsonian Whimbrel in Sussex, and an Eyebrowed Thrush in Shetland. Other top-class rarities included a male Black-eared Wheatear in Hampshire, a Swainson's Thrush in Shetland, Pacific Golden Plover, Paddyfield and Blyth's Reed Warblers in Norfolk, plus singing Blyth's Reed Warblers in Essex and North-east Scotland, an Isabelline Shrike on Scilly and a Black-headed Bunting in Pembrokeshire. There was a good selection of 'southern' herons to choose from, while the influx of European Bee-eaters continued.

Lesser Scaup *Aythya affinis* Long-stayer in East Glamorgan; Blagdon Lake (Avon), 5th July. King Eider *Somateria spectabilis* Long-stayers in North-east Scotland, Shetland and Moray & Nairn (two). Surf Scoter *Melanitta perspicillata* Long Nab (Yorkshire), 23rd June. White-billed Diver *Gavia adamsii* Troon (Ayrshire), 9th June; Eshaness (Shetland), long-stayer to 17th June.

Little Bittern *Ixobrychus minutus* Long-stayers Lakenheath Fen (Suffolk), to 26th June and St Mary's (Scilly), to 9th June when found dead; new arrivals Kirkby-on-Bain (Lincolnshire), 28th June; Old Moor (Yorkshire), 30th June to 8th July. Night Heron *Nycticorax nycticorax* Records from Scilly, Somerset (two) and Staffordshire. Squacco Heron *Ardeola ralloides* Marazion Marsh (Cornwall), long-stayer to 10th June; Saltholme (Cleveland), 18th and 26th June; Kirkby-on-Bain, 27th June; Cemlyn Bay (Anglesey), 30th June; Southease (Sussex), 3rd July. Cattle Egret *Bubulcus ibis* Hersden (Kent), 13th June; Rutland Water (Leicestershire & Rutland), 16th June; Trimley Marshes, then Shotley Marshes (both Suffolk), 28th June. Great White Egret *Ardea alba* Ham Wall (Somerset), high count of 18, 18th June. Purple Heron *Ardea purpurea* St Mary's, St Agnes and St Martin's (Scilly), 14th–25th June; Kenfig (Gower), 19th–23rd June; Ham Wall, 24th June and 4th July. Black Stork *Ciconia nigra* Tuddenham St Mary (Suffolk), 9th June; St Martin's, 9th June; Three Burrows (Cornwall), 9th June; Sharesill (Staffordshire), 10th June; Narborough and South Raynham (both Norfolk), 12th June.

Black Kite *Milvus migrans* Records from Greater Manchester, Kent, Warwickshire, Co. Waterford and Yorkshire.

Black-winged Stilt *Himantopus himantopus* Fingringhoe Wick (Essex), two, 30th June. American Golden Plover *Pluvialis dominica* Tresco (Scilly), 3rd July. Pacific Golden Plover *Pluvialis fulva* Breydon Water (Norfolk), 27th–30th June. Hudsonian Whimbrel *Numenius hudsonicus* Pagham Harbour (Sussex), 9th June to 8th July. Broad-billed Sandpiper *Calidris falcinellus* Frampton Marsh (Lincolnshire), 9th–12th June. White-rumped Sandpiper *Calidris fuscicollis* Long-stayers Frampton Marsh, to 12th June, and Cley (Norfolk), to 21st June; Kilnsea (Yorkshire), 4th–8th July. Terek Sandpiper *Xenus cinereus* Pagham Harbour, 21st–22nd June; Burnham Deepdale (Norfolk), 25th–29th June; Low Newton-by-the-Sea (Northumberland), 4th July. Greater Yellowlegs *Tringa melanoleuca* Titchfield Haven/Posbrook Flood (Hampshire), long-stayer to 8th July. Long-billed Dowitcher *Limnodromus scolopaceus* The Cull, 12th and 28th June; Tacumshin (both Co. Wexford), 14th June. Collared Pratincole *Glareola pratincola* Lakenheath Fen, long-stayer to 11th June.

Gull-billed Tern *Gelochelidon nilotica* Neatholme Fen (Nottinghamshire), 11th June; Old Moor, 16th June; Birsay (Orkney), 20th–22nd June; Hayle Estuary (Cornwall), 1st July; Ynys-hir (Ceredigion), 2nd July; Burton Mere (Cheshire & Wirral), 3rd July. Caspian Tern *Hydroprogne caspia* Easton (Norfolk), 2nd July. Whiskered Tern *Chlidonias hybrida* Wheldrake

Ings (Yorkshire), 13th June; Minsmere (Suffolk), 24th June. **White-winged Black Tern** *Chlidonias leucopterus* Blithfield Resr (Staffordshire), 15th June; Whitburn (Co. Durham), 28th June; Saltholme, 29th June; Middleton Lakes (Staffordshire), 3rd July; Leighton Moss (Lancashire), 4th–5th July; Frampton Marsh, 5th–7th July. **Bonaparte's Gull** *Chroicocephalus philadelphia* Unst (Shetland), 11th June; St Kilda (Outer Hebrides), 12th and 21st June; Oare Marshes (Kent), 20th June to 8th July. **Laughing Gull** *Larus atricilla* Kilnsea, 13th–14th June; Blakeney Point and Salhouse (both Norfolk), 14th June. **Franklin's Gull** *Larus pipixcan* Rusheen Bay (Co. Galway), 13th June; Lough Beg (Co. Derry), 22nd June to 4th July.

Snowy Owl *Bubo scandiacus* Ballinarobe (Co. Mayo), 12th June. **Alpine Swift** *Apus melba* Garnock Floods (Ayrshire), 24th June; Beachy Head (Sussex), 1st July; Spurn (Yorkshire), 8th July. **European Bee-eater** *Merops apiaster* The widespread influx continued, with flocks of up to 12 on Scilly, 11 in Yorkshire, ten in Kent, Lincolnshire, Suffolk and Sussex, eight in Essex and six in Somerset; and records from many other counties.

Red-footed Falcon *Falco vespertinus* Pagham Harbour, 12th June; Landguard (Suffolk), 16th June; Hope Carr (Greater Manchester), 24th June. **Eleanora's Falcon** *Falco eleonorae* St Mary's, 17th June.

Isabelline Shrike *Lanius isabellinus* St Martin's (Scilly), 2nd July. **Woodchat Shrike** *Lanius*

senator Records from Cornwall, Cumbria and Northumberland. **Red-rumped Swallow** *Cecropis daurica* Mizen Head (Co. Cork), 12th June; Burnham Overy Staithe (Norfolk), 17th June; Lerwick (Shetland), 2nd July.

Greenish Warbler *Phylloscopus trochiloides* St Martin's, long-stayer to 11th June; Blakeney Point, 11th June; Skomer (Pembrokeshire), 12th June. **Subalpine Warbler** *Sylvia cantillans* North Ronaldsay (Orkney), 20th–21st June; Fair Isle, 30th June to 3rd July. **Melodious Warbler** *Hippolais polyglotta* Hampton in Arden (West Midlands), 11th June to 8th July; Portland Bill (Dorset), 16th June; Sennybridge (Pembrokeshire), 21st June. **Paddyfield Warbler** *Acrocephalus agricola* Blakeney Point, 11th–14th June. **Blyth's Reed Warbler** *Acrocephalus dumetorum* Holland Haven (Essex), 12th June; Blakeney Point, 13th–14th June; Inverurie (North-east Scotland), 18th–27th June. **Great Reed Warbler** *Acrocephalus arundinaceus* Unst, long-stayer to 22nd June.

Cedar Waxwing *Bombicilla cedrorum* Kilkee (Co. Clare), 3rd–4th June; Tiree (Argyll), 10th June; St Mary's, 19th June; Treginnis (Pembrokeshire), found dead, 27th June. **Rose-coloured Starling** *Pastor roseus* Lundy (Devon), 14th June; Fowlsheugh (North-east Scotland), 16th June; Cotgrave (Nottinghamshire), 18th June; Lewis (Outer Hebrides), 19th–21st June, 5th–8th July; Harris (Outer Hebrides), 24th–28th June; Hoy (Orkney), 24th June; Fair Isle, 2nd July. **Swainson's Thrush** *Catharus ustulatus*

Skokholm (Pembrokeshire), long-stayer to 10th June; Fetlar (Shetland), 16th June. **Eyebrowed Thrush** *Turdus obscurus* Whalsay (Shetland), 20th June. **Black-eared Wheatear** *Oenanthe hispanica* Acres Down (Hampshire), 13th June. **Tawny Pipit** *Anthus campestris* Seaford Head (Sussex), 21st June.

Cretzschmar's Bunting *Emberiza caesia* Bardsey (Caernarfonshire), 10th–20th June. **Rustic Bunting** *Emberiza rustica* Sumburgh (Shetland), 21st June. **Black-headed Bunting** *Emberiza melanocephala* Saundersfoot (Pembrokeshire), 10th June.



281. Cretzschmar's Bunting *Emberiza caesia*, Bardsey, Caernarfonshire, June 2015.

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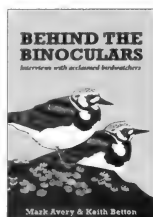
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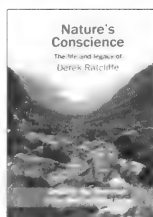
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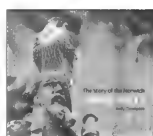
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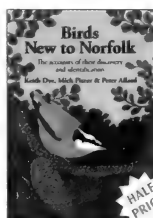
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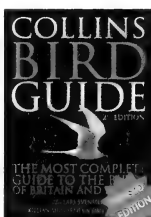


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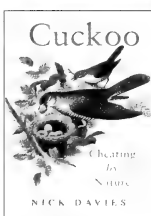
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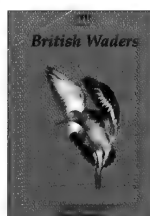


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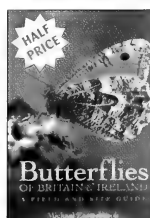
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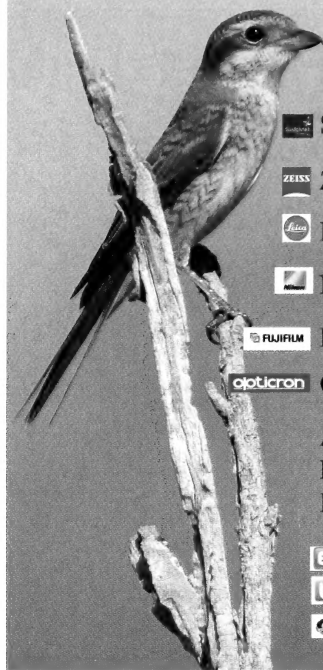
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



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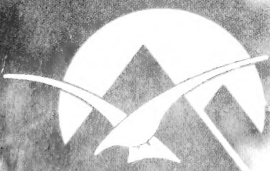
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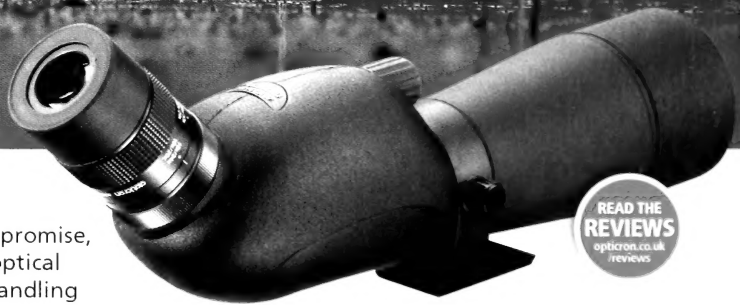
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